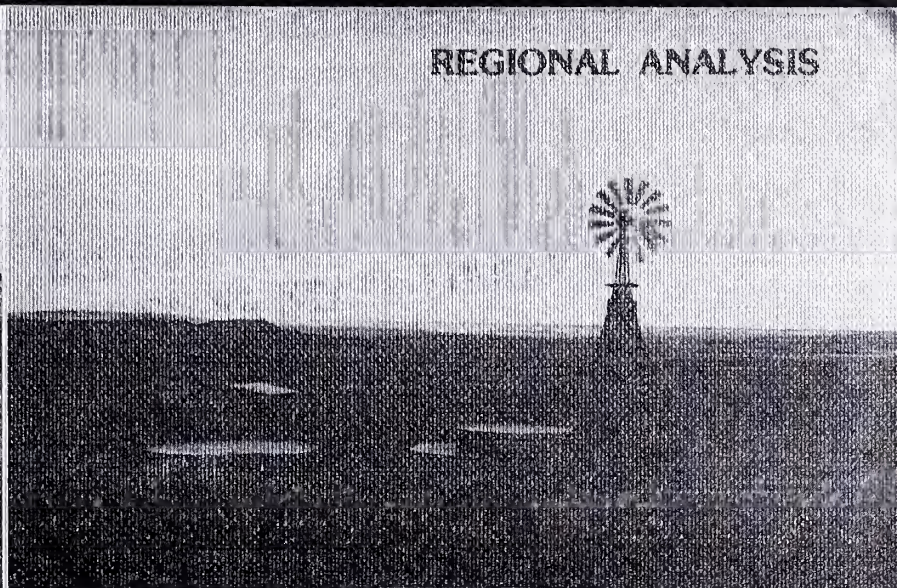
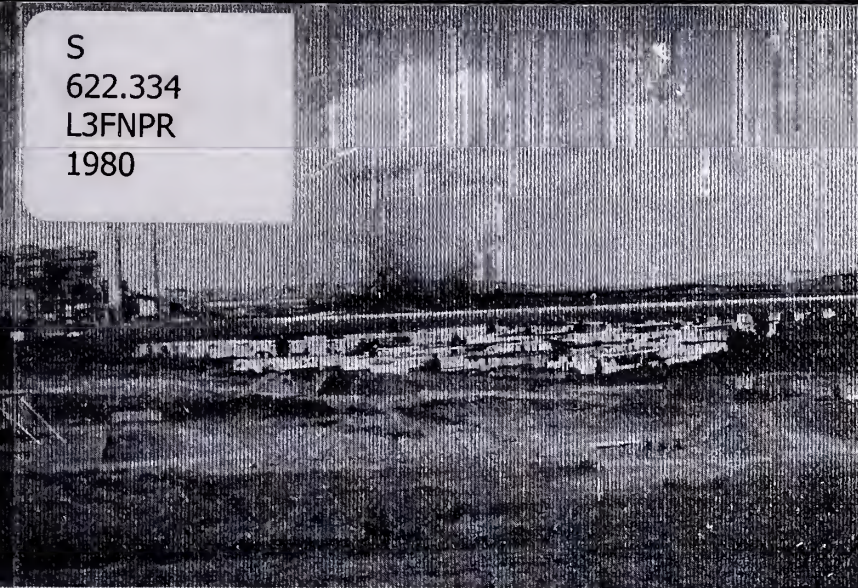


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REGIONAL ANALYSIS



**FINAL
ENVIRONMENTAL STATEMENT**

**NORTHERN POWDER
RIVER BASIN COAL,
MONTANA**

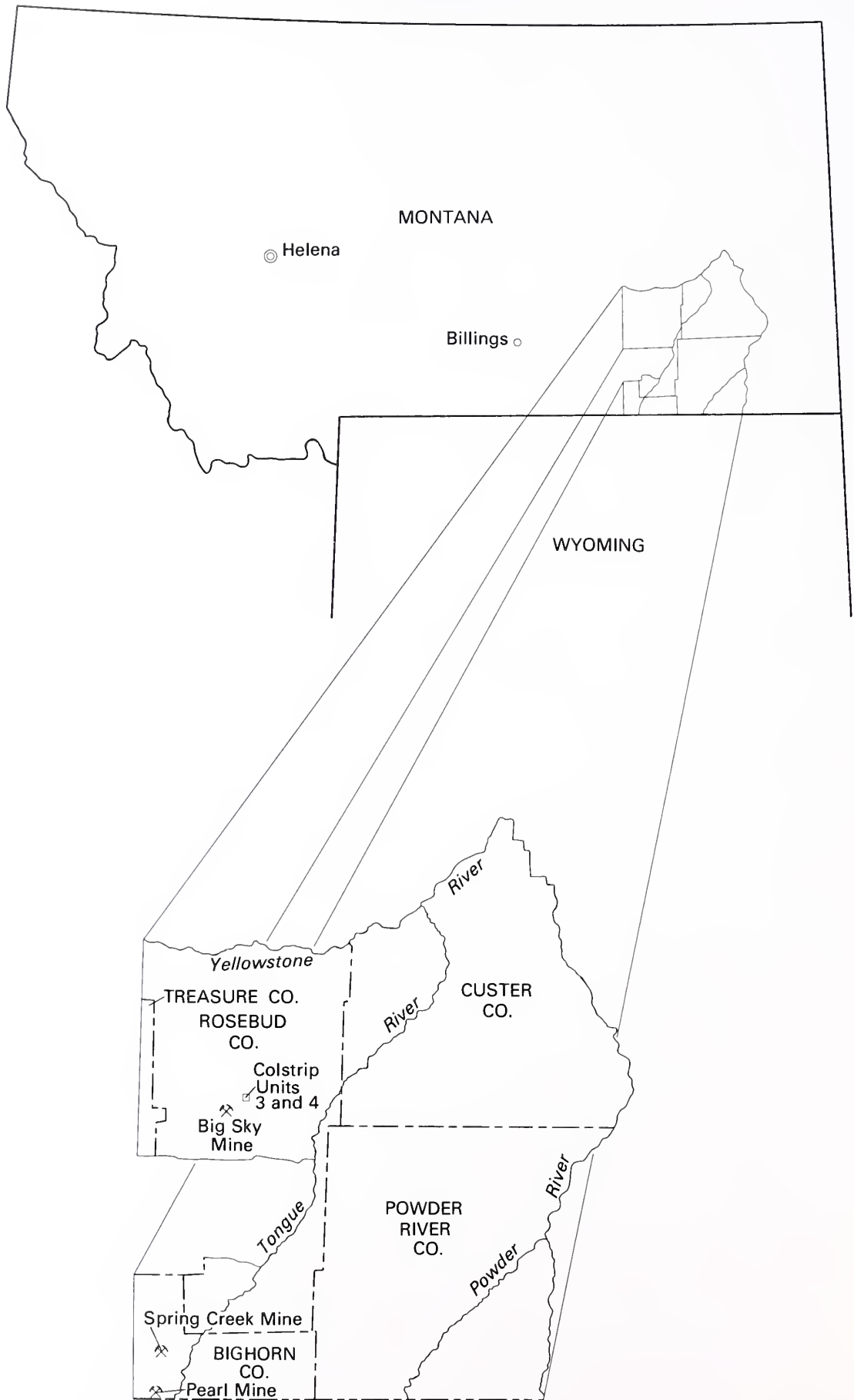


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United States Department of the Interior

GEOLOGICAL SURVEY
RESTON, VIRGINIA 22092

January 9, 1980

Enclosed for your information is the final environmental statement (FES 80-1) for the Northern Powder River Basin, Montana. This statement was transmitted to the Environmental Protection Agency and the Montana Environmental Quality Council on January 9, 1980. Volumes 1 and 3 of this statement constitute a regional analysis of cumulative impacts of proposed coal development, considered in the context of other existing and projected coal related development in the area. The statement analyzes low, intermediate, and high levels of coal production. Volumes 2 and 4 are a site-specific analysis of the proposed Pearl mine (Federal coal lease M-069945, Montana). Two other mine plan proposals, assessed in the regional analysis, were analyzed previously and published separately. The final statement for the Spring Creek mine (FES 79-10) was filed on February 28, 1979, and the statement for the Big Sky mine (FES 79-46) was filed on September 25, 1979. The Spring Creek mine plan was approved on April 11, 1979, by the Office of Surface Mining, Department of the Interior, and is treated as an existing mine in this statement. The Big Sky and Pearl mines are treated as proposed actions.

The plans for the two proposed mines were submitted for review prior to the revision of the 30 CFR Part 211 regulations (43 F.R. 37181 et seq., August 22, 1978), which incorporated the initial regulatory program under the Surface Mining Control and Reclamation Act of 1977 (SMCRA) and were also submitted prior to the April 12, 1979, effective date of the permanent regulatory program on Federal lands under SMCRA, 30 CFR, Subchapter D, 44 F.R. 15332, March 13, 1979. The companies currently are in the process of modifying their mining and reclamation plans to resolve identified problems and to come into conformance with SMCRA and the Montana Strip and Underground Mine Reclamation Act. Reviews of the two pending mine plans for compliance with the applicable requirements of SMCRA and the implementing regulations have not been completed by the Office of Surface Mining Reclamation and Enforcement (OSM). Prior to making any decision on approval of the mining and reclamation plan, OSM will complete the technical reviews for compliance with SMCRA and the applicable regulations. Once the mine plans conform to the applicable requirements of those authorities, OSM will evaluate whether this FES is adequate for mine plan approval action or whether supplemental environmental documents need to be prepared.

If additional copies are needed, a limited number are available on request from the U.S. Geological Survey, Land Information and Analysis Office, Stop 701, Federal Center, Box 25046, Denver, Colorado 80225 (telephone 303-234-3960) and the Montana Department of State Lands, 1625 11th Avenue, Helena, Montana 59601.

Note: on page xii, table of contents, page numbers XI-39 through XI-186 should read IX-39 through IX-186.



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U. S. DEPARTMENT OF THE INTERIOR
MONTANA DEPARTMENT OF STATE LANDS

FINAL
ENVIRONMENTAL STATEMENT
REGIONAL ANALYSIS

NORTHERN POWDER
RIVER BASIN COAL,
MONTANA

Prepared by
U. S. Department of the Interior
Montana Department of State Lands



Leo Berry, Jr., Commissioner
Montana Department of State Lands



H. William Menard, Director
U. S. Geological Survey



PREFACE

The final environmental statement (FES) on Northern Powder River Basin Coal, Montana, consists of four volumes and one folded regional map. Volume 1, regional analysis, and volume 2, a site-specific analysis of the Pearl mine, were originally printed and distributed as draft environmental statement DES 79-41 on July 13, 1979. Comments received on the DES did not require significant changes in data, analysis, or conclusions; therefore, volumes 1 and 2 were not reprinted. They are incorporated in the FES by reference. A limited number of copies of these volumes are available on request from the U.S. Geological Survey, Environmental Impact Analysis Program, Box 25046, Mail Stop 701, Federal Center, Denver, CO 80225.

Volume 3 (this volume) contains explanations in response to comments on the regional analysis (v. 1), changes to be made in volume 1, additions, and a revised list of references. A regional geologic map is included with this volume.

Volume 4 contains explanations in response to comments on the site-specific analysis of the Pearl mine (v. 2), changes to be made in volume 2, and additions.

ENGLISH-METRIC CONVERSION FACTORS

To convert English unit	Multiply by	To obtain Metric unit
Inches (in)-----	2.54	Centimeters (cm).
Feet (ft)-----	3.048×10^1	Centimeters (cm).
	3.048×10^{-1}	Meters (m).
Miles (mi)-----	1.609	Kilometers (km).
Square feet (ft ²)-----	9.290×10^{-2}	Square meters (m ²).
Acres-----	4.047×10^{-1}	Hectares (ha).
	4.047×10^{-3}	Square kilometers (km ²).
Acre-feet (acre-ft)-----	1.233×10^3	Cubic meters (m ³).
	1.233×10^{-3}	Cubic hectometers (hm ³).
Cubic yards (yd ³)-----	7.646×10^{-1}	Cubic meters (m ³).
Pounds (lb)-----	4.536×10^{-1}	Kilograms (kg).
Short tons (tons)-----	9.072×10^{-1}	Metric tons (t).
Pounds per acre (lb/acre)	1.12	Kilograms per hectare (kg/ha).
Btu/lb-----	2.326	Kilojoules per kilogram (kJ/kg).
Gallons (gal)-----	3.785×10^{-3}	Cubic meters (m ³).
Gallons per minute (gal/min)-----	6.309×10^{-2}	Liters per second (L/s).
Degrees Fahrenheit (°F)--	(¹)	Degrees Celsius (°C).

¹Temperature in °C = (temperature in °F - 32)/1.8.

SUMMARY

() Draft (X) Final Environmental Statement

Department of the Interior, U.S. Geological Survey

Montana Department of State Lands

1. Type of action: (X) Administrative () Legislative

2. Brief description of action: This environmental statement is in two parts: a regional analysis and a site-specific analysis of coal development in the northern Powder River basin region of Montana. The regional analysis addresses cumulative impacts of coal development in the region by 1990, with emphasis on industry proposals that now require or have recently required action by Federal and State authorities. Actions are pending on two mining and reclamation plans on existing leases--an expansion of the Big Sky mine, and the proposed Pearl mine. Other proposals--the Spring Creek mine and Colstrip generating units 3 and 4--were approved after most of the regional analysis had been completed; their approval is based partly on separate site-specific analyses. These approved proposals are included in the regional analysis (volumes 1 and 3 of this FES).

A site-specific analysis of the proposed mining and reclamation plan for the Pearl mine makes up volumes 2 and 4 of this FES. Site-specific analyses of the Spring Creek and Big Sky mines are published as FES 79-10 and 79-46, respectively. Colstrip generating units 3 and 4 are addressed in FES 79-29.

Total annual coal production from the designated region of southeastern Montana is estimated at about 39 million tons by 1980, 50 million tons by 1985, and 53 million tons by 1990. The Big Sky, Pearl, and Spring Creek mines would collectively produce approximately 15 percent of the total by 1980, 26.5 percent by 1985, and 25 percent by 1990.

3. Summary of Environmental Impacts

- . Impacts on air quality would be locally significant, in that the National Ambient Air Quality Standards for total suspended particulates would frequently be exceeded near all three minesites during mine life. Degradation of air quality would cause subtle injury to vegetation within about 1 mile of the mines and about 4 miles of the generating units, slightly reducing vegetative productivity.
- . Wildlife populations, primarily antelope, mule deer, and sage grouse, would be significantly reduced during mine life and probably for several decades after mining. Antelope would be affected the most: as many as 300 would be lost in the Decker area during the first severe winter. No threatened or endangered species would be adversely affected.

- Social impacts would be significant in Colstrip and Forsyth--comparable to those experienced during the construction of Colstrip units 1 and 2. The proposed developments would introduce about 6,000 people to the six-county study area (20 percent of the total influx expected by 1990); they would contribute accordingly to the continuation of social impacts that began in the last decade. At least during the 2 or 3 years of most rapid growth, local governments, formal and informal institutions, and social networks in Colstrip and Forsyth would not be able to meet the demands placed on them.
- Population growth associated with the construction of Colstrip units 3 and 4 would create temporary fiscal problems in the town of Forsyth and the school districts in Forsyth and Colstrip; the impact would not be significant, partly because these towns have experience in dealing with growth-related problems. The increase of 1,800 jobs (8 percent of the anticipated total of 23,000 by 1990) would continue the trend of increasing employment in the study area.
- Regional population increases, due in part to the proposals, would stress recreation facilities in Forsyth, Colstrip, Sheridan, and at the Tongue River Reservoir. Facilities would likely be upgraded, so the impact would not be significant.
- Impacts on transportation systems are not expected to be significant. The proposed mines would account for one-sixth of the projected coal train traffic leaving the region by 1990. The potential for train-vehicle accidents would increase commensurately with the increase in train traffic. In addition, noise, dust, and diesel emissions from coal trains would noticeably increase along the rail corridors leading east from the region.
- Disturbance of soils, topography, and vegetation would not be significant from a regional perspective. On about 3,000 acres at the proposed mines, however, soils disturbance would slightly decrease potential vegetative productivity and correspondingly limit long-term land use for livestock grazing and wildlife use.
- The temporary reduction in grazing land by mining would not be significant: the land uses temporarily displaced by mining are abundantly available on other lands throughout the study area. About 3,000 acres would be disturbed by the proposed developments by 1990, causing a loss of about 8,700 animal unit months (AUM's) of forage production through 1990.
- Impacts on water flow and quality would not be significant: demand for water (about 40,000 acre-feet/year by 1990) would probably nowhere exceed available supply, nor would water quality anywhere be degraded enough to interfere with anticipated uses.

mining and the opportunity to study them would be lost. This loss would not be significant because representative sites would already have been studied.

- . The local degradation of esthetic quality near the mines would not be significant, because the minesites are not now esthetically distinctive.

4. Alternatives Considered:

- . Administrative alternatives available to the Secretary of the Interior.
- . Administrative alternatives available to State agencies.
- . Technological alternatives available to Federal and State authorities.
- . Three levels of coal development are assessed in the regional portion (volumes 1 and 3) of this environmental statement. The intermediate level, which is most likely, includes four proposals, two of which (Spring Creek mine and Colstrip units 3 and 4) have been approved. Alternative levels of coal development are also addressed: a low level of production, based on no Federal action, and a high level, based on possible future developments in projected areas of interest.

5. Comments on the draft environmental statement were requested from various agencies, State clearing houses, and the public. See summary attachment 1 and chapter IX.

6. Date draft environmental statement was made available to EPA and the public: July 13, 1979.

7. Date final environmental statement was made available to EPA and the public:

SUMMARY ATTACHMENT

Comments on the environmental statement were solicited from the following agencies and organizations. Those that submitted written statements or testimony at the public hearings are identified with an asterisk (*).

Federal agencies

Advisory Council on Historic Preservation*
Federal Energy Regulatory Commission*
Interstate Commerce Commission
U.S. Department of Agriculture:
 Forest Service*
 Soil Conservation Service*
U.S. Department of the Army; Corps of Engineers*
U.S. Department of Energy; Bonneville Power Administration*
U.S. Department of Health, Education, and Welfare*
U.S. Department of Housing and Urban Development*
U.S. Department of the Interior:
 Bureau of Indian Affairs*
 Bureau of Mines*
 Bureau of Reclamation*
 Fish and Wildlife Service*
 Heritage Conservation and Recreation Service*
 National Park Service*
 Office of Surface Mining*
U.S. Department of Labor:
 Mine Safety and Health Administration*
U.S. Department of Transportation
U.S. Environmental Protection Agency*

State and local agencies

Big Horn County Commissioners
Custer County Commissioners
Employment Security Commission of Wyoming
Montana Bureau of Mines and Geology
Montana Department of Agriculture; Pesticide Division
Montana Department of Community Affairs
Montana Department of Fish and Game*
Montana Department of Environmental Sciences:
 Air Quality Bureau
 Food and Consumer Safety Bureau
Montana Department of Natural Resources
Montana Energy Advisory Council
Montana Environmental Quality Council
Montana Historical Society*
Office of the Governor of Montana
Office of the Governor of Wyoming*
Powder River County Commissioners

State and local agencies--continued

Rosebud County Planning Director
Sheridan Area Planning Agency
Sheridan County Commissioners
Sheridan County Planning Commission
Treasure County Commissioners
Wyoming Department of Administration
Wyoming Department of Revenue and Taxation
Wyoming State Highway Department

Other organizations

ACTION for Eastern Montana
ASARCO Incorporated
Burlington Northern Railroad
City of Gillette
Cumin Associates
Decker Coal Company
Dist. VII Human Resource Council
Milwaukee Railroad
Montana Power Company*
Montana State University
Montco*
Mountain Bell Telephone Company
Northern Cheyenne Research Project*
Northern Energy Resources Co., Inc.*
Northern Plains Resource Council*
Old West Regional Commission
Pacific Power and Light Company
Peabody Coal Company
Powder River Basin Resource Council*
Range Telephone Cooperative
Shell Oil Company
Sheridan Chamber of Commerce
Sheridan-Johnson Rural Electric Association
Sierra Club
Tongue River Electric Cooperative
Tri-County Ranchers Association*
University of Montana
University of Wyoming
VTN, Inc.
Western Energy Company*
Westmoreland Resources, Inc.
Yellowstone-Tongue Areawide Planning Organization

CONTENTS

VOLUME 1 - REGIONAL ANALYSIS

(Chapters I through VIII of the DES are incorporated by reference)

VOLUME 2 - PEARL MINE SITE-SPECIFIC ANALYSIS

(DES incorporated by reference)

VOLUME 4 - PEARL MINE SITE-SPECIFIC ANALYSIS

(FES incorporated by reference)

VOLUME 3

	Page
Preface-----	iii
English-metric conversion factors-----	iv
Summary-----	v
Summary attachment-----	ix
Chapter IX. Consultation and coordination with others-----	IX-1
A. Preparation of the document-----	IX-1
B. Coordination in review of the draft environmental statement-----	IX-2
C. Comment letters and responses-----	IX-3

FEDERAL AGENCIES

1. Advisory Council on Historic Preservation-----	IX-4
2. Department of the Army: Corps of Engineers-----	IX-5
3. Department of Energy: Bonneville Power Administration-----	IX-12
Department of Health, Education, and Welfare: Office of the Principal Regional Official, Region VIII-----	IX-13
5. Public Health Service, Center for Disease Control	IX-14
6. Department of Housing and Urban Development-----	IX-18
7. Federal Energy Regulatory Commission: Washington, D.C.-----	IX-20
Chicago Regional Office-----	IX-21
U.S. Department of Agriculture: 8. Forest Service-----	IX-22
9. Soil Conservation Service-----	IX-25
U.S. Department of the Interior: 10. Bureau of Indian Affairs-----	IX-26
11. Bureau of Mines-----	IX-31
12. Bureau of Reclamation-----	IX-32
13. Fish and Wildlife Service-----	IX-33
14. Heritage Conservation and Recreation Service-----	IX-34
37. National Park Service*-----	IX-174
15. Office of Surface Mining-----	IX-35
16. U.S. Department of Labor: Mine Safety and Health Administration-----	IX-38
36. U.S. Environmental Protection Agency*-----	IX-172

*Letter received after volume was compiled.

	Page
Chapter IX. Consultation and coordination with others--Continued	
C. Comment letters and responses--Continued	
<u>STATE AND TRIBAL AGENCIES</u>	
17. Montana Department of Fish and Game-----	XI-39
18. Montana Historical Society:	
Historic Preservation Office-----	XI-40
Northern Cheyenne Research Project:	
19. Charles Andrews-----	XI-41
20. James P. Boggs-----	XI-45
21. Wyoming Executive Department:	
Governor Ed Herschler-----	XI-51
Attachment A: Wyoming Department of	
Environmental Quality, Land Quality Division---	XI-53
Attachment B: Wyoming Department of	
Environmental Quality, Water Quality Division--	XI-58
<u>COMPANIES, PRIVATE ORGANIZATIONS, AND INDIVIDUALS</u>	
22. Andy P. Bartson-----	XI-61
23. Friends of the Earth--attachments-----	XI-62
24. Bill Gillin-----	XI-66
25. Patty Kluver-----	XI-69
26. J. R. Lee-----	XI-76
27. Montana Power Company-----	XI-92
28. Montco-----	XI-96
29. NERCO-----	XI-101
30. Northern Plains Resource Council-----	XI-112
31. Powder River Basin Resource Council-----	XI-122
32. Robert A. Taylor, Jr.-----	XI-129
33. Tri-County Ranchers Association-----	XI-140
34. David B. Weber-----	XI-142
35. Western Energy Company--attachments:	
TRC Environmental Consultants-----	XI-143
D. Index to comments-----	XI-175
E. Changes and clarifications-----	XI-177
1. Text changes-----	XI-177
2. Corrections and additions to figures and tables-----	XI-179
3. Clarification of scope and purpose-----	XI-183
a. Purpose-----	XI-183
b. Scope-----	XI-183
c. Baseline conditions-----	XI-184
d. Spring Creek mine-----	XI-185
F. Summary of public hearings-----	XI-186
Chapter X. References-----	X-1

ILLUSTRATION

[Map is in pocket affixed to the inside back cover of this volume]

Plate (map 3). Geology and water-yielding characteristics of
rocks of the northern Powder River basin,
southeastern Montana----- In pocket

CHAPTER IX

CONSULTATION AND COORDINATION WITH OTHERS

A. PREPARATION OF THE DOCUMENT

Instructions to prepare this regional environmental statement were issued to the Geological Survey and the Bureau of Land Management by the Secretary of the Interior on April 29, 1976, designating the USGS lead agency. Because of some duplicate or closely related actions pending before Federal and State agencies, and because of the similar requirements of the National and Montana Environmental Policy Acts, the State of Montana joined with the Federal task force in the preparation of this, as well as concurrent site-specific environmental statements. The State task force personnel were under the administrative supervision of a State team leader and the Commissioner of State Lands. Task Force offices were established in Billings and Helena, Montana.

Information was gathered and analyzed by the joint Federal and State task force. Archeological reconnaissance of the proposed minesites was performed under contract by Anthropologos Research International, Inc. of Livingston, Montana, to supplement the data provided in mining applications (report on file at the Montana Department of State Lands, Helena, and the U.S. Geological Survey, EIAP, Box 25046, Mail Stop 701, Federal Center, Denver, CO 80225). Major inputs were provided by the Montana Departments of Natural Resources and Conservation, Community Affairs, Highways, Health and Environmental Sciences, and Fish and Game; Montana State University, Department of Agricultural Economics and Economics (Coal Town II computer model projections); and University of Montana, Department of Environmental Studies (climate and air quality computer model analyses). Input was also provided by the Sheridan County, Wyoming, Board of Commissioners, the Sheridan Area Planning Agency (SAPA), and the Sheridan County Planning Commission. A report on social conditions and projected social impacts in Sheridan County that would result from the Spring Creek mine was prepared for the task force under contract by the Center for Urban and Regional Analysis, University of Wyoming. Reports on demographic conditions and community services in the study area were provided under contract by the University of Montana.

Other Federal and State agencies providing consultation to the preparation of this environmental statement include the following:

<u>Federal agencies</u>	<u>State agencies</u>
Bureau of Mines	Montana Bureau of Mines and Geology
U.S. Forest Service	Montana Energy Advisory Council
U.S. Fish and Wildlife Service	Montana Department of Community Affairs
U.S. Environmental Protection Agency	Montana Historical Society
Bureau of Indian Affairs	Wyoming Department of Administration
Bonneville Power Administration	Wyoming Department of Revenue and Taxation
Interstate Commerce Commission	Employment Security Commission of Wyoming
Office of Surface Mining	

Local agencies	Non-Government organizations
Powder River County Commissioners Rosebud County Planning Director Treasure County Commissioners Public service departments, city governments, and school districts of: Broadus Colstrip Decker Forsyth Hardin Hysham Lame Deer Miles City Rosebud	Burlington Northern Railroad Montana State University Old West Regional Commission Northern Plains Resource Council Northern Cheyenne Research Project Northern Energy Resources Co., Inc. Spring Creek Coal Co. Pacific Power and Light Co. Peabody Coal Company Shell Oil Company MONTCO Montana Power Co. Decker Coal Co. Western Energy Co. Westmoreland Resources, Inc. Cumin Associates Powder River Basin Resource Council Sheridan Chamber of Commerce ACTION for Eastern Montana Dist. VII Human Resource Council

B. COORDINATION IN THE REVIEW OF THE DRAFT ENVIRONMENTAL STATEMENT

In accordance with guidelines of the Council on Environmental Quality and the Montana Department of State Lands, copies of the draft statement were made available to the public for their comments and suggestions. The draft statement was filed with the U.S. Environmental Protection Agency on July 13, 1979 as DES 79-41 (volume 1).

Written comments on volume 1 (DES 79-41) were requested from concerned citizens, industry, environmental groups, and from officials representing all levels of government. Public meetings to receive comments were held in Forsyth, Montana, and Sheridan, Wyoming on August 22 and 23, 1979. All substantive comments were considered in preparing this final environmental statement.

The final environmental statements is available for public review at the following places:

- U.S. Geological Survey Public Inquiries Office, Room 1012, Federal Building, 1961 Stout Street, Denver, CO 80202
- U.S. Geological Survey Library, 1526 Cole Blvd., Golden, CO 80401
- U.S. Geological Survey Library, Room 4A100, USGS National Center, 1201 Sunrise Valley Drive, Reston, VA 22092
- Montana Department of State Lands, 1625 11th Ave., Helena, MT 59601

- . Bureau of Land Management (West of Miles City), P. O. Box 940, Miles City, MT 59301
- . Parmley Billings Public Library, 510 North Broadway, Billings, MT 59103
- . Sheridan County Fulmer Public Library, 320 North Brooks, Sheridan, WY 82801
- . Big Horn County Public Library, 419 North Custer Ave., Hardin, MT 59034
- . The Montana State Library, State of Montana, 930 East Lyndale, Helena, MT 59601
- . The Rosebud County Library, 201 North 9th Ave., Forsyth, MT 59327

C. COMMENT LETTERS AND RESPONSES

Written comments on the draft statement were received from the following agencies, organizations, and individuals. Those comments are reproduced on the following pages along with responses and necessary changes in the text. Each letter received is identified by number; each comment requiring a response, with a capital letter. Comments pertaining to the Pearl mine are answered in volume 4. Letters and responses are numbered differently in that volume.

LETTER 1

**Advisory
Council On
Historic
Preservation**

1522 K Street NW.
Washington D.C.
20005

September 24, 1979

Director
U. S. Geological Survey
National Center
Mail Stop 108
Reston, Virginia 22092

Dear Sir:

This is in response to your request of July 13, 1979, for comments on the draft environmental statement (DES) regional analysis for the proposed Northern Powder River Basin Coal, Montana.

1A Pursuant to its responsibilities under Section 102(2)(C) of the National Environmental Policy Act of 1969, the Council has determined that this DES does not demonstrate compliance with Section 106 of the National Historic Preservation Act of 1966 (16 U.S.C. Sec. 470f, as amended, 90 Stat. 1320). However, it appears that the U. S. Geological Survey understands its responsibilities and will carry them out in the future.

Should you have any questions, please contact Brit Allan Storey of the Council's Denver staff at P. O. Box 25085, Denver, Colorado 80225, or at telephone number (303) 234-4946, an FTS number.

Sincerely,



Louis S. Wall
Chief, Western Division
of Project Review

1A See responses 2L, 14A, 14B, 18A, and 30P.



DEPARTMENT OF THE ARMY
OMAHA DISTRICT CORPS OF ENGINEERS
6014 U.S. POST OFFICE AND COURTHOUSE
OMAHA, NEBRASKA 68102

MRDPD-A

13 September 1979

The Director
U.S. Geological Survey
National Center
Mail Stop 108
Reston, VA 22092

Dear Sir:

We have reviewed your Draft Environmental Statements on the Northern Powder River Basin Coal, Montana, and the Proposed Mining and Reclamation Plan-Pearl Mine, Montana.

Our comments on the two documents have been divided into five categories:

- a. Pursuant to Section 404 of the Clean Water Act
- b. Flood Plain Management
- c. Engineering
- d. Environmental
- e. Cultural Resources

Our comments are appended to this letter.

2A It may be that the activity, as proposed, may require state water quality certification. This can be determined by contacting the Montana Department of Health and Environmental Sciences, Water Quality Bureau, Capitol Station, Helena, Montana 59601.

If you have any questions concerning our comments, please call this office.

Thank you for the opportunity of reviewing these documents.

Sincerely,

1 Incl
Comments

John E. Velehradsky
JOHN E. VELEHRADSKY
Chief, Planning Division

2A Water-quality permits are required from the Montana Department of Health and Environmental Sciences and from the Department of Natural Resources and Conservation. (See page III-6.)

Fill material at the several mines is not expected to have significant impacts on endangered species or on the quantity and quality of water in ponds and streams of the region. See also volume 4, responses to letter 5.

LETTER 2

OMAHA DISTRICT'S COMMENTS ON DRAFT ENVIRONMENTAL STATEMENTS
FOR THE PROPOSED MINING AND RECLAMATION PLAN - PEARL MINE,
MONTANA AND THE NORTHERN POWDER RIVER BASIN COAL - MONTANA

PURSUANT TO SECTION 404 OF THE CLEAN WATER ACT

The comments contained in this section are addressed to both statements.

1. The secondary tributaries of the Yellowstone River including tributaries of Armells and Rosebud Creeks, Youngs & Little Youngs Creeks and Spring Creek, based on the information in this office, have an average annual flow of less than 5 cubic feet per second.

Accordingly, the activities for the purposes of Section 404 of the Clean Water Act are authorized under the nationwide permit without further processing provided the following conditions are complied with:

- a. That the fill material will not destroy a threatened or endangered species as identified under the Endangered Species Act or endanger the critical habitat of such species.
 - b. That the fill will consist of suitable material free from toxic pollutants in other than trace quantities.
 - c. That the fill created by the discharge will be properly maintained to prevent erosion and/or other non-point sources of pollution.
 - d. That the fill will not occur in a component of the National Wild and Scenic Rivers System nor in a component of a State Wild and Scenic Rivers System.
2. In addition to the conditions specified above, the following management practices should be followed to the maximum extent practicable in the performance of the work:
- a. Fills in spawning areas during spawning seasons should be avoided.
 - b. If the fill creates an impoundment of water, adverse impacts on the aquatic system caused by the accelerated passage of water and/or the restriction of its flows, should be minimized.
 - c. Fills in wetlands areas should be avoided.
 - d. Heavy equipment working in wetlands should be placed on mats.
 - e. Fills into breeding and nesting areas for migratory waterfowl should be avoided.
 - f. All temporary fills should be removed in their entirety.

2B See response 2A. No fill material would destroy threatened or endangered species. The only fill would be native alluvial material which would be taken from, and replaced in, the creek bottom of Little Youngs Creek. There would be no toxic pollutants. See also volume 4, responses to letter 5.

3. In the event other waters of the United States or wetlands are to be impacted, the Corps of Engineers, Omaha District should be notified so that their status pursuant to Section 404 may be determined.

FLOOD PLAIN MANAGEMENT

The comments contained in this section are addressed to both statements.

- 2C 1. We have reviewed the two DES's for these projects relative to floodplain management. We are concerned that a provision is not included somewhere that any activity which will alter a floodplain be executed so that the elevation of the 100-year flood will not be increased by more than one foot relative to pre-activity conditions. This should reduce both the potential for increased flooding upstream from the construction activity due to backwater effects as well as downstream due to the failure of embankments which were impounding floodwaters. Also, if channel modifications are undertaken, the new channel should have, as a minimum, the same capacity as the existing channel.

ENGINEERING

The comments contained hereafter are addressed to each Draft Statement individually.

A. Proposed Mining and Reclamation Plan - Pearl, Mine, Montana.

- (1) Chapter I - Page I-16 Item 8. Will the settling ponds accommodate the intense rainstorms and snowmelt referred to on Page II-6 Item B.a.?
- (2) Chapter I - Page I-16 Item G. What type of program will be implemented to insure the long term success of the reclamation program? A 2-year reclamation program following completion of the mining activity does not appear sufficient to insure total recovery of native grasses.
- (3) Chapter II - Page II-12 Item c. Very limited trace metal data appears to have been available. Will the mining activity result in increased trace metal concentrations in nearby streams?
- (4) Chapter II - Page II-9 Item b. Since the mining area is subject to rapid snowmelt and intense rainstorms, the sediment referred to in this section may reach the Tongue River in a relatively short time depending upon flow magnitude.

2

- 2C Although there is no requirement for the control of 100-year floods through flood-plain management, Federal and State regulations do require that reclaimed stream channels have the same capacity as the premining channels; therefore, the behavior of a 100-year flood should not differ from the natural condition. Permanent diversion channels on through-flowing streams must be capable of passing the peak flow from a 100-year storm. See also volume 4, responses to letter 5.

- 2D See table II-2 on page II-17. Although water-quality data derived from one or a few samples may not represent long-term conditions, the table shows the general deterioration of water quality downstream. The record for October was chosen because discharge of the river during the fall season represents base flow--that derived primarily from the ground-water system.

- 2E See response 2C.

- 2F The solubility of mercury and other trace metals is low under conditions of high pH that prevail in the soil and overburden of the area. Thus, trace metal concentrations are not expected to increase significantly. Van Voast and others (1977) observed increases in lead and nickel in the ground water of older spoils at Colstrip, so it is reasonable to expect similar increases in other mined areas. As suggested in response 25B, dissemination of ground water from mine spoils through adjacent aquifers would be very slow. Some rocks in the Fort Union Formation are bentonitic; however, it is unlikely that bentonite beds would be disrupted by mining. Minable bentonite is found in Cretaceous rocks beneath the Fort Union Formation.

- 2G Most streams in the northern Powder River basin are ephemeral and do not have biota that would be significantly affected by coal-related developments likely to occur before 1990. Perennial streams in the region that have important fisheries are identified, and important game fish are named on page II-70. Species lists are not included in order to shorten the document. Species lists were published as Appendix G-1 in FES 79-10 on the Spring Creek mine (U.S. Department of the Interior and Montana Department of State Lands, 1979).

(5) Chapter VII. A table, using some standard energy unit, would be useful in determining the net energy production of this mining operation.

(6) Chapter VIII. It appears that no alternatives such as on-site coal gasification, electrical generation, or other substitutes, were studied. Since this mining operation would utilize large quantities of gasoline and diesel fuel, both for mining and transport of coal, some other alternatives could result in a higher net energy production.

(7) The potential for acid mine drainage is not adequately addressed. In paragraph B.1. of Chapter III, it was stated that water pumped from the mine pits would be discharged into Youngs Creek, no mention was made of acid water content. Ramifications, and if necessary, mitigation should be discussed.

B. Northern Powder River Basin Coal, Montana.

(1) Chapter II - Page II-13 Item B.1. Water quality data from a single sampling date is of very limited use and can be misleading in determining stream water quality. Yearly or seasonal averages established over a period of several years would provide a more accurate picture of existing water quality.

(2) Chapter IV. Would the settling ponds accommodate the intense rainstorms and snowmelt which occur in the project area?

(3) Chapter IV. Little mention is made of trace metals, such as mercury, which can be high in some areas of Montana. Will mining activities, such as opening of bentonite seams, increase existing levels?

(4) Chapter IV. Some of the project area streams may be impacted; however, little mention is made of existing stream biota.

(5) Chapter VIII. It was repeatedly stated in this DES that water quality impacts will be negligible. However, the hypothetical mine model along the Tongue River indicated significant water quality impacts. The differences between the hypothetical model and the proposed mining operation are not clear. These should be discussed and results clearly stated.

(6) The potential for acid mine drainage does not appear to be addressed, nor was the potential for increased soil erosion during the construction of haul roads.

ENVIRONMENTAL

A. Proposed Mining & Reclamation Plan-Pearl Mine, Montana.

(1) Chapter III. Little mention is made of the aquatic life presently existing in Youngs Creek. The statement that detrimental effects will not occur should be substantiated.

2H The reference to a model analysis of a hypothetical mine along the Tongue River can now be expanded from the published abstract by Woessner (1979) to a more extensive discussion by Woessner and others (1979). The hypothetical mine would be located on the Northern Cheyenne Reservation, southwest of Ashland and on the west side of the Tongue River. The mine would extract coal from the 60-foot thick Knobloch seam at a rate of 9 million tons per year over a period of 30 years. According to the model, water-quality degradation from the leaching of mine spoils would be more adverse to the quality of the associated groundwater system than to the quality of the Tongue River. Ground water hydraulically downgradient from the mine area would increase in total dissolved solids (TDS) by 300-2,070 mg/L, depending on the recharge rate. The increase in TDS of a stream with a mean annual flow of 14.2 m³/s could amount to 1-26 mg/L. (The mean annual flow of the Tongue River at Miles City, based on 34 years of record, is 12.46 m³/s according to the U.S. Department of the Interior, Water Resources Data for Montana, 1977, p. 490.) Ground-water quality is extremely variable among various shallow aquifers in the region (Van Voast and Hedges, 1975; Van Voast and others, 1977). Total dissolved solids in ground water ranges from about 500 mg/L to more than 7,000 mg/L. Table II-2 (page II-17) shows that TDS in the Tongue River, during a period of base flow, ranged from 540 mg/L near Decker to 694 mg/L at Miles City. An increase of 1-26 mg/L of TDS in the Tongue River due to the hypothetical mine would hardly be significant.

Although a site-specific analysis of the Nance mine-site is not included with this regional statement, it is likely that hydrologic conditions are not the same on the east side of the Tongue River as on the west. The hydraulic gradient toward the river is probably several times steeper on the west side than on the east side. The rate of ground-water movement and of ground-water discharge into the Tongue River would be several times greater on the west side than on the east. A direct correlation cannot be made, therefore, between the modeled hypothetical mine and the Nance mine.

2I There is no reason to anticipate acid drainage from coal mines in the region: the overburden is generally of high pH (greater than 7; alkaline), and the coal has a very low sulfur content.

Erosion during construction of haul roads would be controlled under the same Federal and State requirements as all other surface disturbance in the mine permit areas.

(2) General Comments. Some of the project area streams may be impacted in terms of existing fisheries, yet no species list for fish is contained in the DES.

(3) After the addition of pit water from the Pearl Mine to Youngs Creek the waters may be similar in their Ca, Mg, and Na content to the Youngs Creek waters below Ash Creek mine. The sodium adsorption ratio of these waters range from 3.5 and 29. Waters with ratios over 20 could cause problems for irrigators which is contrary to the statement on page III-6 of Pearl Mine DES. Discussion is warranted.

(4) More detailed information should be available on the diversion of Little Youngs Creek.

B. DES Northern Powder River Basin Coal, Montana.

2J (1) Chapter II. Some of the project area streams may be impacted in terms of existing fisheries and other stream biota, yet no species list for fish is contained in the DES.

2K (2) Chapter IV. What effect would increased sediment load due to mining operations have on existing stream biota?

CULTURAL RESOURCES

A. Proposed Mining and Reclamation Plan - Pearl Mine, Montana.

(1) Chapter II - Page II-44. The document indicates that archeological site locations are on file with state and federal offices and may be viewed. Under no circumstances should specific site locations be made available to the public. Availability of such information only increases vandalism of and damage to sites by amateur collectors and commercial antiquities dealers. In both cases this results in a permanent loss of information to professional archeologists and ultimately, the public. It is not necessary to provide this information to the public under the Freedom of Information Act. Specific site locations are regularly withheld from the public in most states.

(2) Chapter III. Guidelines for the protection of deeply buried archeological sites which cannot be identified by surface survey need to be made. It is not necessary that these resources be lost because they were not identified before mining as stated on Page VII-1, para. 9. This is routinely required in other earth-moving activities on Federal lands.

B. Northern Powder River Basin Coal, Montana.

2L Discounting the existence of Cultural Resources on private land is illegal. The following are an Executive Order and Public Laws which refer to Cultural Resources found on private land.

2J See response 2C.

2K As stated on page IV-42, adverse impacts on fish due to increased sediment load in the Tongue River and its reservoir would not be significant. The same is true of other perennial streams in the region. Impacts on microscopic organisms could be locally severe, such as immediately downstream from a mine. We have attempted to show impacts as they would affect the uses of streams. Fishing is an important use, and fish are sensitive to changes in their environment.

2L Provisions for protecting cultural resources are less clearly defined for private lands than for federally leased lands; and protective requirements are likely to be less rigorously enforced. Those are the bases for forecasting that cultural resources would probably be "less stringently" protected on private lands.

LETTER 2

Executive Order 11593

"Section 1... Agencies of the executive branch of Government... shall... (3), in consultation with the Advisory Council on Historic Preservation... institute procedures to assure that Federal plans and programs contribute to the preservation and enhancement of non-federally owned sites, structures, and objects of historical, architectural or archeological significance...."

Public Law 86-523

"SEC. 3. (a) Whenever any Federal agency finds, or is notified, in writing, by an appropriate historical or archeological authority, that its activities in connection with any Federal construction project or federally licensed project, activity, or program may cause irreparable loss or destruction of significant scientific, prehistorical, historical, or archeological data, such agency shall notify the Secretary, in writing, and shall provide the Secretary with appropriate information concerning the project, program, or activity...."

"SEC. 4. (a) The Secretary, upon notification, in writing, by any Federal or State agency or appropriate historical or archeological authority that scientific, prehistorical, historical, or archeological data is being or may be irrevocably lost or destroyed by any Federal... assisted or licensed project, activity, or program, shall, if he determines that such data is significant and is being or may be irrevocably lost or destroyed and after reasonable notice to the agency responsible for funding or licensing such project, activity, or program, conduct or cause to be conducted a survey and other investigation of the areas which are or may be affected and recover and preserve such data (including analysis and publication) which, in his opinion, are not being, but should be, recovered and preserved in the public interest."

Public Law 89-665

"SEC. 106. The head of any Federal agency having direct or indirect jurisdiction over a proposed Federal or federally assisted undertaking in any State and the head of any Federal department or independent agency having authority to license any undertaking shall, prior to the approval of the expenditure of any Federal funds on the undertaking or prior to the issuance of any license, as the case may be, take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register. The head of any such Federal agency shall afford the Advisory Council on Historic Preservation established under title II of this Act a reasonable opportunity to comment with regard to such undertaking."

LETTER 2

The operation of a coal strip mine on public or private lands requires the issuance of federal licenses and permits, and federal inspection to remain in operation, all of which constitute federal actions as referenced in the above legislation. Hence, cultural resources must be addressed, even on private lands. Any federal action undertaken without addressing impacts on cultural resources places the agency responsible in violation of federal law.

LETTER 3



Department of Energy
Bonneville Power Administration
P.O. Box 3621
Portland, Oregon 97208

In reply refer to: SJ

August 27, 1979

J. R. Balsley, Director
U.S. Geological Survey
National Center, M/S 108
Reston, Virginia 22092

Dear Director Balsley:

3A The Bonneville Power Administration has reviewed the draft EIS on coal development in the Northern Powder River Basin. Our only comment is that the document could be strengthened by including additional discussion and analysis on the impacts of transporting the coal or energy produced to point of use. This should include rail, transmission lines, and pipelines.

Thank you for the opportunity to comment. If we may be of assistance, do not hesitate to contact us.

Sincerely,

John E. Kiley
Environmental Manager

3A Chapter IV, Transportation, identifies cumulative impacts from rail transport of coal to the extent possible, given the information available. The discussion, although general, is adequate to show the kinds of impacts that would be expected. The impacts of transporting coal from the region by slurry line are not examined because there are no firm proposals pending before State or Federal Governments. The impacts of the transmission lines from the Colstrip power generating units are discussed in FES 79-29 prepared by the Bonneville Power Administration.



DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

REGION VIII
FEDERAL OFFICE BUILDING
19TH AND STOUT STREETS
DENVER COLORADO 80284

August 8, 1979

OFFICE OF THE
PRINCIPAL REGIONAL OFFICIAL

ROFEC

Mr. J. R. Balsley
Acting Director
Geological Survey
U.S. Department of the Interior
Reston, Virginia 22092

Dear Mr. Balsley:

This acknowledges receipt of your Draft EIS for Northern Powder River Basin Coal, Montana.

4A The DEIS is significant in that it is one of the first we have seen that begins to adequately address the social implications. The important point is that the development will have little or no positive social effects on any of the populations we consider vulnerable. All effects are neutral or negative as the Statement points out. We agree that this rather depressing conclusion is indicated by current information, and we feel it is important that we find ways of changing the effect so that it will not be so negative.

4B You indicate that schools in the area are generally adequate for the existing population. However, no comments are being solicited from any educational agency. Before a final EIS is prepared the local schools, as well as the Montana and Wyoming State Departments of Education, should be consulted and allowed to prepare written comments on how this project will effect the educational quality of the area because of the projected increase in population.

Sincerely yours,

Thomas E. Moore
Thomas E. Moore
Director, ROFEC
Regional Environmental Officer

4A Possible means of lessening impacts on people are discussed in chapter VIII, Technical Alternatives, Economics; and in the responses 31W through 31BB.

4B In response to this comment, copies of volume I were mailed to the Montana and Wyoming Departments of Education, and to the superintendents of schools in Sheridan, Rosebud, and Big Horn Counties. No comments were received from those agencies. Responses 31T and 31U discuss problems of school crowding in Sheridan County.

LETTER 5



DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE
CENTER FOR DISEASE CONTROL
ATLANTA, GEORGIA 30333

August 31, 1979

Director
U.S. Geological Survey
National Center
Mail Stop 108
Reston, Virginia 22092

Dear Sir:

We have reviewed the Draft Environmental Statement (ES) on the Northern Powder River Basin Coal, Montana, and the Draft Environmental Statement on Proposed Mining and Reclamation Plan, Pearl Mine, Big Horn County, Montana. We are responding on behalf of the Public Health Service.

In reviewing the regional analysis for the above project which involves all of the mining and reclamation plans for the Basin, we offer the following comments:

Health and Safety

5A A brief discussion should be presented in the ES about the occupational hazards associated with mine development and operation. The overall health and safety program that will be implemented to reduce occupational health problems and potential hazards should also be mentioned. In addition, it should be explained if local health services can accommodate the expected number of accidents and injuries related to the proposed action.

Air Quality

According to the ES, the air quality impacts of the proposed actions would be significant. We understand that the National Ambient Air Quality Standards (NAAQS) for total suspended particulates "... would frequently be exceeded near all three mine sites during mine life."

5B Since the Big Sky Mine is in a "nonattainment area," and is a major stationary source, we note that construction or modification is not permitted by the State if emissions from the sources would cause violation of NAAQS unless the total suspended particulates (TSP) are offset by an emissions decrease elsewhere. The ES should clarify if the offset can and will be permitted and whether the other two mines and the Colstrip units will require offsets as well.

5A A rough projection of injuries and fatalities at the mines is provided on page VII-1, paragraph 3. Because accidents at the mines would be sporadic, local health services could handle them, although transportation from the mine to facilities would take time. In the unlikely event of a major accident injuring large numbers of workers, health services would probably be overloaded. The mining companies have trained personnel and facilities for first aid.

5B EPA proposed a new offset ruling in the Federal Register, September 5, 1979 (Vol. 44, no. 173). To date these requirements have not been promulgated. See also comments 36B and 36C.

Page 2 - Director

5C The ES reveals that the U.S. Environmental Protection Agency has tentatively determined that the new scrubbing process on the additional Colstrip units 3 and 4 will meet the required "best available control technology" and the prevention of significant deterioration (PSD) requirements for sulfur dioxide. It should be clarified whether the emissions under the new pollution controls would in fact meet the revised NAAQS.

5D We believe this document should address the possible long-term health effects upon workers and local residents from the predicted emission concentrations that are associated with the additional Colstrip units, its coal handling facilities, and the mine sites.

Secondary Effects

5E While the proposed project provides a general description of the capability of the existing infrastructure (page II-109-110), it fails to address the project's potential impacts upon this infrastructure, i.e., housing, water, sewer, and solid waste services. It is important that mine development be controlled such that it is in a time frame consistent with infrastructure improvements. Special land use and development controls must be carefully considered in the mining permit process in order to prevent the overloading of infrastructure facilities and interim or long-term violation of State and Federal environmental regulations.

The following comments are specific to the proposed mining and reclamation plans for the Pearl Mine:

Air Quality

According to the ES, 6,000 tons of particulate emissions would be added to the air each year for 24 years. This represents a significant air quality impact unless it can be satisfactorily reduced. Even with the use of best available control technology (BACT) for dust abatement, air quality in the vicinity of the mine will not meet NAAQS unless emission controls are also implemented at the adjacent Ash Creek Mine. The ES should indicate whether the Ash Creek Mine will be required to use BACT to reduce its emissions so that the combination of emissions from both Ash Creek and the proposed Pearl Mine will meet NAAQS.

We note that the majority of the emissions, approximately 82 percent, or 4,920 tons/year, result from haul roads and coal handling facilities. While BACT will be used in controlling fugitive dust on haul roads, its effectiveness in controlling fugitive dust caused by natural winds and mine vehicles using temporary dirt roads (less than 2 months) and the overburden storage area, should be noted as well.

5C It is the role of regulatory agencies, such as EPA, OSH, and the Montana Department of Health and Environmental Sciences, to determine whether the proposed developments comply with recently revised standards. It is the role of the EIS to identify the responsible agencies and the necessity of compliance before final action can be taken. See also comments 36B and 36C.

5D Air quality standards have been developed in order to protect human health over the long term. Compliance with the standards is designed to mitigate long-term health hazards. A summary of "potential human health effects from exposure to high concentrations of atmospheric particulates," by Dr. Dale Bergren, was included in FES 79-10 (U.S. Department of the Interior and Montana Department of State Lands, 1979) as Appendix D-4.

5E Potential impacts on the infrastructure are discussed in volume 1, pages IV-59 through IV-60.

LETTER 5

Page 3 - Director

Another significant source is coal dust loss, 8,000 tons per year, due to the transport of open coal train cars. It should be indicated whether the described binding agent controls during coal loading operations would in fact be required as part of BACT.

Water Supply

It appears that some wells in the project areas are dependent upon local aquifers for recharge. In fact, the ES indicates that a nearby ranch house may be deprived of its present water supply because of mining operations. The ES should specify the number of wells providing potable water and the population using wells in the area that could ultimately be impacted by this project or future expansion. We believe measures to adequately mitigate any loss of potable water to local livestock wells, homes, etc. should be incorporated into the project.

Water Quality

Interim and permanent revegetation of disturbed soils is important in order to reduce erosion and potential water quality degradation in the project area. We understand that the overburden material contains numerous strata that exceed the State suspect level guidelines for determining overburden suitability for revegetation. Apparently "...overburden spoils located at and near the regraded surface..." will be negatively influenced by the clay percentage, the materials' high electrical conductivity, a high sodium-adsorption-ratio, and excessive nickel, molybdenum, cadmium, and nitrate concentrations. It appears that the Shell Oil Company has chosen to rely on mixing of the overburden materials, rather than selective salvage, to reduce the spoils' toxic concentrations. We note that this technique will probably not eliminate problems. Therefore, the significance of the above factors in negating interim revegetation of the overburden storage area and long-term revegetation of the reclaimed area with topsoil additions should be discussed.

The potential effects of leachate or surface runoff from the overburden storage area and other exposed areas of the mine upon local wells or water systems should also be addressed. The adequacy of retention basins and chemical treatment measures to retain adverse nutrient and heavy metal concentrations in settling ponds should also be discussed.

Secondary Effects

It is noted in the ES that long-term impacts from this proposal could be significant because the applicant will probably apply for

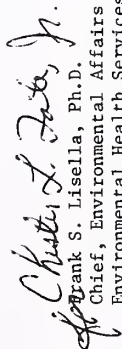
Page 4 - Director

leases of the adjacent coal. The extent of the commercial coal reserves in the area, particularly those adjacent to the project area, should be explained to provide the public with a better idea of the predicted future expansion.

5F The effects of the project upon community services such as water supply, housing, solid waste, and sewage treatment have not been satisfactorily addressed. Both the short- and long-term effects upon the infrastructure of local communities should be discussed.

Thank you for the opportunity of reviewing these documents. We would appreciate receiving two copies of the final environmental statement when it is available.

Sincerely yours,


Frank S. Lisella, Ph.D.
Chief, Environmental Affairs Group
Environmental Health Services Division
Bureau of State Services

5F The discussion of Community Services in volume 1, p. IV-56 through IV-60, emphasizes impacts on the infrastructure from a regional perspective. The effects of the Pearl mine are considered to be relatively insignificant because of the small percentage of growth attributable to that mine.

LETTER 6



DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
REGIONAL/AREA OFFICE
EXECUTIVE TOWER - 1405 CURTIS STREET
DENVER, COLORADO 80202

September 11, 1979

REGION VIII

IN REPLY REFER TO:

8S0Q

Mr. H. William Menard
U. S. Geological Survey
National Center
Mail Stop 108
Reston, Virginia 22092

Dear Mr. Menard:

Thank you for the opportunity to review and comment on the Draft Environmental Impact Statement (EIS), for the proposed Northern Powder River Basin Coal, Montana.

Your Draft EIS has been reviewed with specific consideration for the areas of responsibility assigned to the Department of Housing and Urban Development (HUD). The review considered the proposal's compatibility with local and regional comprehensive planning and impacts on urbanized areas. Within these areas this document is adequate.

6A You should address the cumulative or secondary impacts that this coal development will have beyond the boundaries of southeastern Montana. These potential impacts include those of air quality, noise, and property values adjacent to the coal hauling lines.

6B In this context, it is recommended that you address the impacts on an estimated number of dwelling units which could be adversely affected by the anticipated coal development. A methodology to mitigate these impacts should also be included in your analysis.

6A Some impacts from industrial developments within the designated region would extend beyond the regional boundaries. The EIS examines such impacts to the extent they are significant. See for example p. IV-10, paragraph 3; p. IV-57, paragraph 1; and p. IV-65, paragraph 1.

Property value losses along the existing rail lines are expected to be slight because the lines have long been used for hauling freight and coal and because coal train traffic would not greatly increase. (See figure IV-16.) The new rail spurs to the Pearl and Spring Creek mines would cross private lands; the companies would have to compensate the affected landowners.

6B The number of dwelling units which could be adversely affected along the coal hauling lines is not known. The major effect would be slight increases in noise and air pollution in areas already affected. Suggesting methods to mitigate those impacts (such as requiring alternatives to rail transport of coal) is beyond the scope of this statement.

AREA OFFICE
Denver, Colorado

2

If you have any questions regarding these comments, please contact Mr. Carroll Goodwin, Area Office Environmental Clearance Officer, at FTS 327-3102 in Denver.

Sincerely,


Raymond D. McKinney

Director
Program Planning and Evaluation

LETTER 7

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, D.C. 20426

August 13, 1979

Director, U.S. Geological Survey
108 National Center
Reston, VA 22092

Dear Sir:

I am replying to your request to the Federal Energy Regulatory Commission for comments on the Draft Environmental Impact Statement for the Northern Powder River Basin Coal, Montana. This Draft EIS has been reviewed by appropriate FERC staff components upon whose evaluation this response is based.

No response required.

The staff concentrates its review of other agencies' environmental impact statements basically on those areas of the electric power, natural gas, and oil pipeline industries for which the Commission has jurisdiction by law, or where staff has special expertise in evaluating environmental impacts involved with the proposed action. It does not appear that there would be any significant impacts in these areas of concern nor serious conflicts with this agency's responsibilities should this action be undertaken.

Thank you for the opportunity to review this statement.

Sincerely,



Jack M. Heinemann
Advisor on Environmental Quality



FEDERAL ENERGY REGULATORY COMMISSION
CHICAGO REGIONAL OFFICE
230 SOUTH DEARBORN STREET, ROOM 3130
CHICAGO, ILLINOIS 60604

September 26, 1979

Director
U.S. Geological Survey
National Center
Mail Stop 108
Reston, Virginia 22092

Dear Sir:

We have reviewed the Draft Environmental Statement titled, "Northern Powder River Basin Coal, Montana," covering the opening of a new coal mine and associated facilities.

Comments of this office are made in accordance with the National Environmental Policy Act of 1969 and the August 1, 1973 Guidelines of the Council on Environmental Quality. Our principal concern with developments affecting land and water resources is their possible effect on developed and undeveloped hydroelectric resources and natural gas pipeline facilities.

Because the above-noted proposed development would not pose a major obstacle to the construction or operation of such facilities and because the Draft does not indicate that existing natural gas or hydroelectric developments would be adversely affected, we have no specific comments.

These comments are of this office and therefore do not necessarily represent the views of the Federal Energy Regulatory Commission.

Thank you for the opportunity to comment on this Draft Environmental Statement.

Sincerely,

A handwritten signature in dark ink, appearing to read 'Lawrence F. Coffill', is written over the typed name.

Lawrence F. Coffill
Regional Engineer

No response required.

LETTER 8

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
FEDERAL BUILDING
P.O. BOX 7669
MISSOULA, MONTANA 59807

1950



H. William Menard, Director
USDI, Geological Survey
National Center
Reston, Virginia 22092

Dear Mr. Menard:

Following are our comments on the Draft Environmental Impact Statement for the Northern Powder River Basin Coal, Montana.

8A We suggest that the page iii summary include a regional perspective for the impacts on air quality and wildlife. The described impacts appear significant for a specific site, but are they significant on a regional basis?

Air quality impact represents less than 1 percent of the total area.

The wildlife assessment was done on two subregions containing approximately 1,022 square miles or 14 percent of the total regional area. Some of the excerpts in Chapter IV, pages 38 through 43 are:

1. "Colstrip units 3 and 4 would adversely affect relative stationary wildlife species to an unknown, but probably not severe, degree."
2. "No threatened or endangered species would be adversely impacted by the proposals."
3. "There would be locally severe effects on sage grouse . . ." The emphasis on "locally" is ours. The data indicates most of the adverse impacts would be from one mine.
4. "The loss due to the proposed mines would not seriously reduce sharptail populations."
5. "Regional loss of mule deer habitat would not be serious."

8A Air quality impacts from the proposed mines would not be significant throughout the entire region, although the overall level of development by 1990 would noticeably degrade air quality over considerably more than 1 percent of the region. Existing air quality standards would be exceeded only in limited areas near the mines and generating units.

Not all wildlife species would be significantly affected --as the summary points out, antelope, mule deer, and sage grouse would be affected the most, primarily in the Decker subregion. Those impacts would occur over several hundred square miles in the Decker area and, thus, would have some regional importance.

2

6. "The loss of deer populations from these mines . . . a maximum of about 35 . . . would be small."

7. "The proposed mines would have little effect on white tailed deer since the riparian habitat on which deer depend would not be destroyed."

8. Raptors - "The loss of these sites would not be severe since other local sites would still be available."

9. " . . . proposed and projected mining would probably not lower the prey base enough to cause population declines. Smaller raptors such as marsh hawks and kestrels would benefit from the temporary increase in small rodents on reclaimed minesites."

10. Other Animals - "The proposed mines would reduce populations of some songbirds species, but the overall loss would be small: only a small part of the region would be disturbed . . ."

11. " . . . losses of reptiles and amphibians . . . would not likely be significant because of the regional abundance and distribution of reptiles and amphibians."

12. "Adverse impacts on fish in the Tongue River and its reservoir would not be significant."

We question the summary statement "Wildlife populations . . . would be significantly reduced during mine life" as applied to the entire 7,400 square miles.

Since most people will only read the summary, we feel that these conclusions should be closely scrutinized and readers be made aware of the perspective under which the conclusions were reached.

The following is a list of editing problems:

8B Chapter I, page 1 - The Surface Mining Control and Reclamation Act was signed in May 1977, not May 1976.

8C Chapter I, page 2 - The Coal Creek Mine is located inside of the National Forest Boundary by about 1 mile.

8D Chapter II, page 43 - 1978 data for SO₂ emissions from Units 1 and 2 quoted from a 1976 publication.

8E Chapter II, page 70 - Table II-18 - The paragraph preceding the table says that the Tongue River and Tongue River Reservoir are the most important sport fishery waters in the area. Then the table rates part of them lower than the Powder, Hanging Woman Creek, and Rosebud

8B The last line of paragraph 2 on page I-1 should read: "Surface Mining Control and Reclamation Act of 1977."

8C Correction noted.

8D The first paragraph on page II-43 is changed to read: "Total annual SO₂ emissions from units 1 and 2 were projected in 1974 to be 23,700 tons (Montana Department of Natural Resources and Conservation, 1974)."

8E The comment is correct. Sport fishing values are not the sole criterion used in the ratings.

LETTER 8

3

Creek. Probably the reason the Powder River is rated 1. is because it supports a rare species of fish (the sturgeon chub) and is also important because the lower end is used by paddlefish and may be important in their spawning. In other words, if the ratings for the streams and reservoir were based on their value as a sports fisheries, the Tongue River and Reservoir would be rated 1.

The Draft Environmental Impact Statement should have a footnote or paragraph explaining the ratings in Table II-18.

Thank you for the opportunity to review this environmental impact statement.

Sincerely,

for Jane E. Laird
TOM COSTON
Regional Forester



United States
Department of
Agriculture

Soil
Conservation
Service
P.O. Box 970
Bozeman, Montana
59715

September 10, 1979

Mr. J. R. Balsley, Director
U. S. Geological Survey
National Center
Mail Stop 108
Reston, VA 22092

Dear Mr. Balsley:

We acknowledge receipt of the draft environmental statement for Northern Powder River Basin Coal, Montana, and Pearl Mine, Big Horn County, Montana, that was received by Van K Haderlie, State Conservationist, Bozeman, Montana, Soil Conservation Service, on July 20, 1979, for review and comment.

No response required.

We have reviewed the above draft environmental statement and find that there are no controversial items in the statement within the realm of the Soil Conservation Service's expertise and responsibilities. We find no conflict with any SCS on-going or planned programs or projects.

We appreciate the opportunity to review and comment on this proposed project.

Sincerely,

Van K Haderlie
State Conservationist

cc: Director, Office of Federal Activities (Mail Code A-104)
Environmental Protection Agency
Room 537, West Tower
401 M Street, S.W.
Washington, D.C. 20460

Kenneth L Williams, Director, TSC, SCS, Portland, Oregon
Norman A. Berg, Administrator, SCS, Washington, D.C.



LETTER 10



United States Department of the Interior
BUREAU OF INDIAN AFFAIRS

BILLINGS AREA OFFICE
316 NORTH 26TH ST
BILLINGS MONTANA 59101

IN REPLY REFER TO:
Environmental
Quality

Memorandum

To: Director, U.S. Geological Survey
Reston, Virginia

From: Office of the Area Director

Subject: Review of Draft Environmental Statement, Development of
Coal Resources in Southeastern Montana (DES 79/41)

This office has, as requested, reviewed the subject environmental statements. Our comments are limited to those areas wherein we have jurisdiction and or special expertise.

Northern Powder River Basin Coal, Montana

10A 1. Page II-13, Hydrology. This section in part discusses the appropriated and unused discharge of the Tongue River and other streams. We believe it would be appropriate that inasmuch as water quantity and quality of the streams in the vicinity of the mining will likely be reduced, that Indian water rights be discussed. It should be recognized that lands within a reservation hold a reserved right to use the waters which are adjacent to originate on and/or flow through the reservation. This reserved right is to guarantee waters sufficient in quantity and quality to fulfill the present and anticipated needs of the Tribes. Certainly any reduction in flow or water quality would be in contradiction to these rights.

10B It must also be recognized that at the present time there is litigation under way in Wyoming and Montana which involves the adjudication of the Tongue River. The United States is a defendant in this suit on behalf of the Northern Cheyenne Tribe.

10C 2. Page II-43 discusses emissions from area sources. We would suggest that the combined effects of emissions from generating plants and coal mines be discussed as to how it will impact the Northern Cheyenne and their Class I air quality redesignation. It appears from the discussion that there is every likelihood that power plant emissions, acid rains, etc., will adversely

10A Indian water rights are protected under Article VI of the Yellowstone River Compact, which states that "nothing contained in this compact shall be so construed or interpreted as to affect adversely any rights to the use of the waters of the Yellowstone River and its tributaries owned by or for Indians, Indian tribes, and their reservations."

Coal-related developments discussed in this regional statement would not significantly affect the quantity or quality of surface or ground water on either the Crow Reservation or the Northern Cheyenne Reservation.

10B Comment noted.

10C By approving the construction of Colstrip units 3 and 4, the U.S. Environmental Protection Agency declared that the Class I air quality designation of the Northern Cheyenne Reservation would not be violated. Continual monitoring will be required by both State and Federal regulatory agencies.

affect the environs of the Northern Cheyenne. The text should also discuss the precautions, monitoring, possible modification of mining plans, etc., that will be taken to insure that the air quality and other related values are protected and that the trust responsibility of the United States Government is fulfilled.

10D 3. Page II-77. We suggest including a map to indicate locations of the various Indian events. Questions arise. For example, where did the Rosebud Creek battle occur after the Little Big Horn battle? General Crook was defeated at the head of Rosebud Creek in a battle with Northern Cheyenne and Sioux warriors five days before the battle of the Little Big Horn. This should be considered a battle of major importance because Crook was marching to meet the 7th Cavalry. Custer could have been provided with a large additional force. What then would have been the outcome of the battle at Little Big Horn? The battle with General Crook took place on land now owned by Montana Rancher, Mr. Slim Kobold. Although the site has been marked by a Billings group known as Daughters of the Revolution, to our knowledge the site has never been proclaimed a State or National Park. A map and expanded discussion would clarify the issue.

10E 4. Page II-78. Define miners as gold miners.

10F 5. Page II-90. It may be noted that unemployment on the Northern Cheyenne Reservation took a rather sharp increase with completion of Colstrip generating Units I and II. An investigation of the statistics should show larger decreases in Indian labor at Colstrip than decreases in the number of non-Indian workers. The hiring and laying-off of large numbers of Indian workers by the Colstrip facilities has had negative influence on the Northern Cheyenne Tribe not discussed in the draft statements. We believe they should be considered.

10G 6. Page II-104. Indians are served by Indian Health Service facilities at Lane Deer and Crow Agency. They maintain their own ambulance and hospital services. It should be noted that emergency care will be provided non-Indians for serious illness or accident.

An emergency helicopter ambulance service operated by Billings hospitals provides service to Southeastern Montana.

10H 7. Page II-114. See our comments on the road between Busby and Decker under the Draft Environmental Statement for the Pearl Mine.

10D The historical discussion was included for background only. Several commenters pointed out errors in the discussion. (See letters 20 and 32.) Because the proposed coal developments would not adversely affect the historic sites mentioned, it is not necessary to provide the additional maps and detailed discussion requested.

10E Clarification noted.

10F The text is revised--insert following sentence at end of section c. Unemployment on page II-90: "The U.S. Bureau of Indian Affairs reports that the hiring and laying off of Indian workers at Colstrip has had adverse effects on the Northern Cheyenne Tribe." (See comments 10I and 35GG.)

10G Noted.

10H Mining in the Decker area would likely cause small increases in traffic on Highway 314 on the Northern Cheyenne Reservation, thus making maintenance more difficult. Total traffic levels related to coal mining would remain fairly low. The breakdown of the highway may have been due more to problems with construction of the road and its use by heavy vehicles, such as cattle and logging trucks.

LETTER 10

3

1018. Page VIII-13. Reservation Employment - we believe this discussion should be expanded to detail the number of expected Indian and non-Indian workers employed at all of the Northern Powder River Basin Coal companies. Will these figures adhere to EEO and other labor standards? If not, what will be done to see that the expected number of Indians are employed? It is a known fact that when the labor force at Colstrip was shortened after completion of generating Units I and II an unnecessarily large percentage of Indian workers lost their jobs.

Proposed Mining and Reclamation Plan, Pearl Mine

1. Page I-16. Sewage - Sewage disposal at the mine could pose serious problems in the Tongue River Reservoir if State and Federal standards are not adhered to. Because the reservoir is used as a recreation area and a great deal of swimming and boating occurs no effluents should be allowed to enter a drainage leading into either the Tongue River or the reservoir. A large group of Northern Cheyenne people sponsor an annual three or four day camp out on the reservoir shores. A foolproof system of protecting the reservoir from effluents must be built into the sewage system.
2. Page II-42. Transportation Systems - it should be noted that since development of coal mining in the area to the east of the Crow Indian Reservation that on and off road travel has increased substantially on the reservation. In the event the Shell-Pearl Mine is approved it is anticipated that travel on restricted trust lands will increase significantly. This fact should be addressed in the EIS and proper steps taken by mining and other responsible officials in concert with the Crow tribe to eliminate this trespass.
3. Page III-3. Hydrology - the text states that portions of aquifers within the perimeter of the pit will be destroyed during mining and that large inflows would occur. The text also states that dewatering of the alluvial aquifer along Little Youngs Creek would occur both upgradient and downgradient from the South pit. We are extremely concerned as to these above-mentioned effects on the water supply of the Crow Indian Reservation in the area of this proposed mining operation. We would refer you to our comment No. 1 under the "Northern Powder River Basin Coal, Montana, EIS".
4. Page III-7. Hydrology - we suggest that a discussion on Mercury, Hg, should be included in this discussion. As you are aware, the element can have serious adverse effects upon fish, wildlife, and humans.

- 101 Future Indian employment was projected on the basis of past experience unless the companies had specific plans to the contrary. In general, half of the employees of companies mining Crow-owned coal would be Crow tribal members, but no more than 4 percent of the employees of mines near the Northern Cheyenne Reservation would be members of that tribe.

Title 49, MCA, chapters 1, 2, and 3; and Title VII of the Federal Civil Rights Act of 1964 provide for enforcement of EEO standards.

5. Page III-26. Employment - we believe the EIS should include a discussion concerning the employment of Indians. Both Crow and Northern Cheyenne towns are in close enough proximity to the Pearl Mine to provide workers of various abilities. Because the Northern Cheyenne Tribe suffers an unemployment problem it seems logical to expect some relief from the establishment of new businesses. A case in point is the hiring of Indians at the generating facilities in Colstrip, Montana.
6. Page III-32. Highways - we believe a serious problem will exist because of mine caused traffic. The main access to the mine is an existing county road from Highway 338. Highway 338 ties into Highway 314 at a junction with the Decker mines. Highway 314 from Busby is not mentioned in the draft statements.

After establishment of the Decker mines, it was noted that Highway 314 assumed a tremendous burden of traffic. So much, in fact, that the old paved portion across the west boundary of the Northern Cheyenne Reservation was completely broken down in a period of about twenty four months. The road was in good condition in 1972. Because of the large volume of heavy traffic, the ruined black top had to be mechanically broken-up and eliminated. The road has not yet been rebuilt. That part of Highway 314 from the Reservation border to a point about six miles north of the Decker mines has always been dirt with some gravel surface. The section between the Decker mines and the Birney road was newly paved in 1973.

It may be possible that an increased traffic flow due to the Pearl Mine may further complicate maintenance of the reservation section of Highway 314. At present, that part of the road is maintained by the Bureau of Indian Affairs, Northern Cheyenne Agency, Branch of Roads. Maintenance has become an increasingly difficult problem due to rapid breakdown of the road. Indian livestock operators shipping cattle from home ranches along Highway 314 have been told by their truckers that they may stop hauling because of the road condition.
7. Page VIII-2. Air Quality - because of the long air distance (approximately 36 miles) to the Northern Cheyenne Reservation south border we do not believe particulate pollution of air, at the mine site, will be a threat to the Class I Air Standard of the Reservation. However, this matter is not discussed in the Draft Statement and we believe it should be studied. If particulates were to carry farther than 36 miles in north to northeast directions it is possible the air quality of the reservation

LETTER 10

5

would be harmed. The Class I Standards, monthly wind vectors and particulate carrying distances of fugitive dusts should be reviewed. If harmful effects become obvious then mitigating measures should be planned to alleviate them. If the Northern Cheyenne Class I Air Standard cannot be protected, then entering into the mining operation may become a gamble for the Shell Company.

8. Page V-1., briefly discusses that air quality, visibility, esthetic values, and stability of the ecosystem will occur in the vicinity of the mine site. The Crow Indian Reservation lies directly to the west of this proposal and presumably will be adversely affected by this proposal. This brings up several points that must be resolved: 1) the plan must be coordinated closely with the Crow Tribal Council, 2) a monitoring system for air quality and water quality and quantity should be set up on the reservation to measure any adverse effects, 3) a buffer zone of sufficient distance to reduce or eliminate the adverse effects of this proposal on the Crow Indian Reservation must be considered.


Acting Area Director

OFFICE OF THE DIRECTOR



United States Department of the Interior

BUREAU OF MINES
2401 E STREET, NW.
WASHINGTON, D.C. 20241

September 12, 1979

DES 79/41

Memorandum

To: Director, Geological Survey

From: Director, Bureau of Mines

Subject: Draft environmental statement, Northern Powder River Coal Basin Regional Analysis, and Proposed Mining and Reclamation Plan, Pearl Mine, Big Horn County, Montana

A preliminary draft environmental statement, as well as the subject statement, have been reviewed by the Bureau of Mines representative on the Northern Powder River Basin EIS Task Force. Comments made for the preliminary draft have generally been incorporated in the current draft statement, and we have no further suggestions to improve this document.

No response required.

William B. Galt
Assistant Director



LETTER 12



United States Department of the Interior

BUREAU OF RECLAMATION
Upper Missouri Region
P.O. Box 2553
Billings, Montana 59103

IN REPLY
REFER TO: UM-150

Memorandum

To: Director, U.S. Geological Survey, Reston, Virginia

From: **Acting** Regional Director, Billings, Montana

Subject: Draft Environmental Statement, Development of Coal Resources
in Southeastern Montana and Proposed Pearl Mine (DES 79-41)

12A The statements describe in-depth soils associated with the proposed mining operations and often refer to problem physical and chemical properties associated with many of the soils. It would be desirable to show actual laboratory analyses for the A through C soil horizons that indicate adverse soil conditions. If analyses are not available then horizons should be sampled and analyzed. Suggested screenable tests to be conducted would be: particle-size analysis, disturbed hydraulic conductivity, moisture retention, soil pH-1:5, EC and SAR values, trace element determinations and other tests deemed necessary.

The first sentence in Chapter VIII-4 of Volume II - Proposed Mining and Reclamation Plan, Pearl Mine states, "Limiting reclamation use of topsoil and nontoxic substrate to material not exceeding 2 ppm molybdenum content--the soil suspect level for the element." The state suspect level for selenium is 2.0 ppm but 0.3 ppm for molybdenum.

Robert H. Madsen

cc: Director, Office of Environmental Project Review, Office of the
Secretary, Department of the Interior, Washington, D.C. 20240
Commissioner, Attention: 150

12A Laboratory analyses for soils are a required part of every mine permit application filed with the State of Montana. The analyses are on file at the Montana Department of State Lands, Helena, and at the Office of Surface Mining, Denver. Results of those analyses, particularly including any toxic materials or adverse soil conditions, are summarized in sufficient detail.



**UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE**

Billings Area Office
Federal Building, Room 3035
316 North 26th Street
Billings, Montana 59101

August 31, 1979

IN REPLY REFER TO:
CC

Director
U.S. Geological Survey
National Center, Mail Stop 108
Reston, VA 22092

Dear Sir:

This constitutes the FWS comments regarding the Northern Powder River Basin Coal and Proposed Mining and Reclamation Plan, Pearl Mine Environmental Statements.

With but one exception, these EIS's adequately cover impacts to fish and wildlife resources. The one exception is in the cumulative impacts assessment.

13A Cumulative impacts are mentioned somewhat casually, and admittedly, are hard to assess. However, with the level of impact occurring and projected, the FWS believes real emphasis should be made for planned development of the region. This will benefit not only fish and wildlife resources, but all disciplines as well.

Sincerely,

Robert M. Ballou
Acting Area Manager

cc: FWS/OEC, Washington D.C.

13A Cumulative impacts were addressed to the degree possible, given limited information on wildlife values at some of the projected minesites. Your comment calling for planned development is noted; this EIS serves as part of the necessary planning.

LETTER 14



United States Department of the Interior

HERITAGE CONSERVATION AND RECREATION SERVICE
WASHINGTON, D.C. 20240

IN REPLY REFER TO
DES-197/41

Memorandum

To: Director, Geological Survey

From: Director, Heritage Conservation and Recreation Service

Subject: Review of Draft Environmental Statement, Development of Coal Resources in Southeastern Montana

We have reviewed the above document in accordance with your July 13, 1979, memorandum. Recreational and natural resource concerns appear to have been adequately addressed; however, we have the following comments concerning treatment of cultural (historic and archeological) resources.

14A It appears that considerable historic and archeological resource identification and evaluation has already taken place. However, the final environmental statement should document the results of all National Register determination of eligibility requests and all consultations with the Montana SHPO and the Advisory Council on Historic Preservation concerning mitigation of adverse effects. This includes the results of the Section 106 evaluation and consultation process for Devastation Shelter in the Pearl Mine area, as well as documentation of the Advisory Council's finding of "no adverse effect" for the Bunny Chase Archeological Site.

14B We note that the Regional Analysis volume (p. II-125) contradicts the Pearl Mine Area analysis (p. II-44) concerning the potential National Register eligibility of 14 archeological sites in the Pearl Mine area. The final statement should clarify this discrepancy.

Finally, the final statement should briefly discuss the survey methods used and actual area surveyed in the proposed Pearl Mine area. It is unclear from the draft statement whether the rail spur, relocated roads, transmission corridors, and other ancillary facility areas were included in the survey work. The final statement should clarify this to insure complete fulfillment of National Historic Preservation Act requirements.

Thank you for the opportunity to comment.

Harold Green
for Chris Therrell Delaporte

14A Volume 1, chapter III, identifies the applicable regulations and summarizes the available information regarding such requests and consultations. Full documentation of these requests and consultations is beyond its scope; such documentation is on file with the Office of Surface Mining and the Montana SHPO. Letter 18, from the SHPO, suggests that cultural resources have not yet been fully evaluated for the Pearl minesite, so the documentation is incomplete.

14B Text should read: "The remaining 14 sites are not believed to be eligible for the National Register * * *."

Volume 4 (Pearl mine) further clarifies this issue.



United States Department of the Interior
OFFICE OF SURFACE MINING
 Reclamation and Enforcement
 WASHINGTON, D.C. 20240

Memorandum

To: Director, U.S. Geological Survey

Through: Assistant Secretary--Energy and Minerals

For: Acting Director

Subject: Review of Draft Impact Statements

The Office of Surface Mining has reviewed the draft environmental impact statements entitled "Northern Powder River Basin Coal, Montana (Regional Analysis)," and "Proposed Mining and Reclamation Plan, Pearl Mine, Montana" and has the following general comments. Detailed comments are presented in Appendix A for the Regional Analysis and in Appendix B for the proposed Pearl mine.

15A

The draft regional analysis adequately discusses the broad impacts that could occur from increased coal development in the study area. However, because protection of alluvial valley floors in the West is a major feature of SMCRA, the final regional analysis should evaluate the potential cumulative adverse impacts of mining operations on alluvial valley floors--to the extent that this evaluation is possible. A map showing potential alluvial valley floors in the study area should also be included in the regional analysis.

There are some potentially significant impacts which cannot be properly assessed by the information presented in the draft Pearl Mine Plan. The draft indicates (on p. II-10, III-8) that the existence of alluvial valley floors in the permit area has not yet been determined, therefore the impacts of mining on such lands have not been evaluated. The designation of Little Youngs Creek and Youngs Creek valleys as "alluvial valley floors" under SMCRA would require significant modification of the Pearl Mine Plan. Any alteration of the mine plan that was not addressed in the FES would require at least an environmental assessment and might require the preparation of a supplemental EIS if the alteration causes significant impacts. The plan implemented upon designation of alluvial valley floors within the Pearl Mine site should be discussed as an alternative to the proposed plan. With this, the impacts will be assessed and proper mitigating measures revealed.

The diversion of Little Youngs Creek in the Pearl Mine site may have significant environmental impacts. Data relative to the dimensions, slope, construction material, and length of diversion should be evaluated in the FES to insure that the impacts of that diversion are considered.

15A

The proposed developments are in widely separated drainages, and their cumulative effect on alluvial valley floors would thus be negligible; their effects on the hydrology of alluvial valley floors (considering, where applicable, their interaction with other projected developments) are discussed in FES 79-12 (Spring Creek mine), FES 79-46 (Big Sky mine expansion), and the present FES and its companion volume 1. Volume 3 includes a regional map showing mapped alluvial deposits--materials laid down by streams; some of these deposits may occupy alluvial valley floors, but that has not yet been determined. Similar alluvial deposits too small to show on this map have been mapped by Malde and Boyles (1976).

LETTER 15

Other incomplete hydrologic studies mentioned in the draft Pearl Mine Plan should be completed for inclusion in the FES (see attached comments). Such studies are necessary in determining the rate of flow into the pit (and consequently discharge into Youngs Creek), the effects of lower water levels in the alluvium of Little Youngs Creek, and the impacts of mining on ground water quality.

Attachment

Attachment

Detailed Comments on the Regional Analysis

- 15B** 1. Page II-11, Figure II-5--Color key should be consistent with figure colors.
- 15C** 2. Page II-19, paragraph 6, line 7--omit the word "is."
- 15D** 3. Page II-70, Table II-18--Should "Tongue River II (Tongue River dam to Wyoming line)" read "Tongue River III."
- 15E** 4. Page III-3, paragraph 2, line 3--Change to read:
 "This Act is implemented by the Office of Surface Mining (OSM) under 30 CFR 700, which provide for:
- o Development of the initial regulatory program to be incorporated into coal mining permits issued under State and Federal law; and
 - o Implementation of the permanent regulatory program:
- 1) Environmental performance standards for surface coal mining and reclamation operations;
 - 2) Requirements and approval procedures for State programs;
 - 3) Requirements for surface coal mining and reclamation operations on Federal lands and Federal-State cooperative agreements for the Federal lands program;
 - 4) Requirements for development and implementation of a Federal program for a State;
 - 5) Requirements and procedures for approval of State and Federal mining permits;
 - 6) Inspection and enforcement procedures, including the assessment of civil penalties;
 - 7) Requirements for posting, release, and forfeiture of reclamation performance bonds; and
 - 8) Assistance to small operators in meeting permit application requirements."
- 15F** 5. Page IV-14, Table IV-3--What are the units of measurement for this table?
- 15B** Correction noted. The explanation key to figure II-5 on page II-11 should be same density as on the map.
- 15C** Correction noted.
- 15D** Correction noted.
- 15E** The revision is noted.
- 5F** The units are tons/year.

LETTER 16

U.S. DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION
4015 Wilson Boulevard
Arlington, Virginia 22203



Dr. H. William Menard
Director, U. S. Geological Survey
National Center, Mail Stop 108
Reston, Virginia 22092

Dear Dr. Menard:

This is in response to Dr. J. R. Balsley's letter of July 13, 1979, requesting our comments relative to your draft environmental statements on the Northern Powder River Basin and the Pearl mine in Montana.

No response required.

The statements seem to be very comprehensive in defining, analyzing, and evaluating the probable impacts of the proposed actions. None of the described environmental, socioeconomic, or operational factors should affect our programs other than to require us to conduct additional inspection and enforcement activities in this region whenever new mining operations begin.

We thank you for this opportunity to comment on your statements.

Sincerely,

A handwritten signature in cursive script, reading "Robert B. Lagarde".

Robert B. Lagarde
Assistant Secretary
for Mine Safety and Health

LETTER 17

STATE OF MONTANA



DEPARTMENT OF

FISH AND GAME

Helena, MT 59601
August 2, 1979

re: Northern Powder River Basin DES

Director
U. S. Geological Survey
Mail Stop 108
Reston, Virginia 22092

Dear Sir:

We have reviewed the Northern Powder River DES and find it to be an acceptable document. There are several relatively minor comments we wish to make relating to the Regional Overview of Wildlife section beginning on page II-69.

17A

It should be noted that while winter ranges may be a critical factor to many wildlife populations, other habitat types may become critical in nature during abnormal moisture years. For example, during very dry years, availability of mesic habitat types may become a critical factor in the welfare of mule deer populations. Also, while mule deer do not appear to migrate in the generally accepted sense of the word, they do undergo some rather extensive shifts in habitat use.

17A Noted.

17B

The Yellowstone River bottom should be included as a high use area for white-tailed deer and bald eagles. Also, the Powder and Little Powder rivers support significant populations of Merriam's turkeys.

17B Noted. The mines considered in this EIS would not directly disturb the Yellowstone, Powder, or Little Powder Rivers. The Moorhead Reservoir included in the high level of coal development would inundate a great deal of wildlife habitat on the Powder River, as noted in chapter VIII.

The impact section of the DES appears to be quite good.

Thank you for the opportunity to review this document.

Sincerely,

Robert R. Martinka, Chief
Bureau of Baseline Studies

RRM/sd

cc: Environmental Quality Council
Clearinghouse, OBPP
Keith Seaburg



MONTANA HISTORICAL SOCIETY

HISTORIC PRESERVATION OFFICE

225 NORTH ROBERTS STREET • (406) 449-4584 • HELENA, MONTANA 59601

August 23, 1979

Geological Survey, National Center
Mail Stop 108
Reston, VA 22092

RE: 79-07-01
Northern Powder River Basin Coal,
Montana Proposed Mining and Reclamation
Plan, and Draft Environmental Statement,
Pearl Mine, Big Horn County, MT

Dear Sirs:

Your Draft Environmental Statement on the Northern Powder River Basin Coal in Montana points out a serious problem in cultural resource management of the area. As little survey work has been done, it is difficult to evaluate the significance of a few sites on any one impact area.

On January 18, 1979, Ed Zaidlicz, State Director of the Bureau of Land Management corresponded with the Office of Surface Mining, and pointed out deficiencies in the survey of the impact area of the Pearl Mine. I have no documentation that this work was ever completed. Compliance with Section 106 of the Historic Preservation Act is not complete. Determinations of eligibility have been requested only for the Bunny Chase site 24BH1574. Determination requests must be made for all other sites in the project area before consultation with the Advisory Council can begin.

I encourage you to begin the compliance procedures as soon as the inventory work is completed so as not to delay this aspect of environmental review.

Sincerely,

Edrie Vinson

Edrie Vinson, Program Manager
for

Ken Korte, State Historic Preservation Officer

EV/prb

cc State Clearinghouse

18A Comment noted. Cultural resources for the proposed Pearl minesite have not yet been fully evaluated. The OSM has assumed BLM's responsibility for protecting cultural resources that would be impacted by proposed mines. See also response 30P and volume 4, responses to letter 18.



Northern Cheyenne Research Project

P. O. Box 388
Lame Deer, Montana 59043
Phone (406) 477-6278

Sept. 6, 1979

Dear Sir:

I have read with interest the Northern Powder River Basin Coal, Montana environmental impact statement. As a resident of the area I enjoyed having a compilation of basic data on the area. Unfortunately, much of what I read dismayed me. Specifically, I am left with the impression that this document is not a regional EIS, and that the document was hastily done, and as a result is not of high quality. Because of a lack of time I unable to discuss many of my comments, but I will go over a few of my major complaints.

Procedural Comments

19A This environmental impacts statement is not a regional analysis and all references to a regional analysis should be excluded. The impact statement is merely an incomplete review of the impacts of two surface mines, one surface mine expansion, and two coal fired generating units. Four environmental impact statements condensed under one cover.

A regional analysis of the Northern Powder River Basin Coal should include explicitly all coal lands of the northern part of the basin. Excluding the Cheyenne Reservation, the parts of the Crow Reservation and the Crow ceded area with coal, and the northern part of Wyoming with the mineable coal is political gerry mandering--an act uncalled for in a regional analysis. The implications of this gerry mandering are severe when it is realized that the Westmoreland Mine and the Big Horn Mine are excluded from consideration because they lie just miles outside of the boundary of the area.

The Northern Cheyenne Reservation represents a large percentage of the

19A See chapter IX, Clarification of Scope and Purpose. The Westmoreland mine and the Big Horn mine were included in the analysis, particularly in the economic and sociology sections.

LETTER 19

population in the Northern Part of the Basin, also a large percentage of the land area. Besides, the Reservation is centrally located, in fact almost in the center of the Colstrip and Decker mine concentrations. To exclude the Reservation from explicit consideration is to not do a regional analysis.

Air Quality

There are several glaring errors in the air quality sections, errors so severe that they undermine everything said about air quality.

19B 1. On page IV-17 (Table IV-7) the emissions of SO₂ and NO_x are incorrect.

The values listed are potential, not as controlled or actual emissions.

19C 2. On page II-43 correct emission rate of NO_x is stated, but SO₂ potential, and not as controlled emissions are stated. This causes confusion.

19D 3. NO, not SO₂ is the most abundant pollutant form Units 1 & 2, and will be the most abundant pollutant from Units 3 & 4. From Units 3 & 4 NO will exceed SO₂ emission by a factor of 7. EPA has refused to compel MPC to control NO, and as a result significant air quality impacts can be expected.

19E 4. Also, it is unthinkable not to adjust the emission concentrations of SO₂ for the changes MPC has made in the scrubber design. MPC who know has a PSD permit to construct Units 3 & 4 is not likely to alter the scrubber design now. The as controlled emissions from Units 3 & 4 will be:

SO ₂ -----	3.317 tons/yr
NO _x -----	23.219 tons/yr
CO-----	1.992 tons/yr
HC-----	597 tons/yr

19B The title of table IV-7 should be changed to read:
"Potential controlled gaseous emissions from Colstrip units 1-4 * * * based on currently proposed controls."

19C Paragraph 1 on page II-43 gives the potential, controlled SO₂ emissions. The projection of 23,700 tons/year is based on information in Montana Department of Natural Resources and Conservation (1974).

19D The first sentence on this page is deleted.

19E Thank you for supplying these data.

Water Quality

19F On page VIII-5, your arguments are ambiguous. On one line you say that the mine won't contaminate the Tongue River, and on the next you quote Woessner (1979) who says that the mine will contaminate the Tongue River.

I agree with Woessner, and we have written a paper,

Woessner, W., C. Andrews, and T. Osborne, The Hydrologic Impacts of Coal Strip Mining on the Northern Great Plains: A Case Study of the Northern Cheyenne Reservation, Journal of Hydrology, v. 43 (to be published fall 1979)

that expresses well our views on hydrologic impacts of strip mining in the area.

19G Also, I found the water quality section to be poorly referenced. Statements such as "the rate of recharge to mine spoils will be much less than the rate of recharge to native soils"; "spoils water quality will be twice as bad as natural water quality" are made frequently in these section without citing any evidence to support the position taken. In my opinion, an EIS should be a summary of relevant research and not an opinion rag.

Misc.

19H 1. On page IX-2 the Northern Cheyenne Research Project is listed as a non-governmental organization. The Northern Cheyenne Research Project is a governmental unit. The Research Project is the scientific branch of the Northern Cheyenne tribal government.

19I 2. On page II-28 the references to the 21 yr climatic cycle should be deleted. This is just speculation, and has no place in this type of document unless you wish to review the other plausible theories for predicting or not predicting climatic change. I'm not

19F See response 2H.

19G This section shows that even "if" the amount of dissolved solids in effluents from the mine areas were doubled, the effect on the Tongue River would be negligible.

19H Noted.

19I The text points out that precipitation trends suggest short-term cyclic variations, and that a recurrence of drier conditions can be reasonably anticipated within about the next decade. Data from many different scientific disciplines support the idea of cyclic changes in climate on the order of hundreds of years (Euler and others, 1979).

LETTER 19

overwhelmed by the correlation between the 21 yr theoretical cycle and actual data. The real question though is, what does this speculation add to your analysis? Nothing, and therefore it should be deleted.

19J 3. Many references quoted in the text are not in the bibliography.

19K 4. The slashes separating paragraphs (ie page IV-2) are unnecessary and distracting. I kept thinking that I was coming to footnotes.

Why not eliminate them as unnecessary separators.

19J Additions to the list of references are included in chapter X.

19K This format is intended to assist the reader by briefly identifying the most significant impacts.

Sincerely



Dr. Charles Andrews
geologist

(copy)



Northern Cheyenne Research Project

P. O. Box 388
Lame Deer, Montana 59043
Phone (406) 477-6278

COMMENTS ON THE DRAFT ENVIRONMENTAL STATEMENT, NORTHERN POWDER RIVER BASIN
COAL, MONTANA

James P. Boggs, Ph.D.
Research Sociologist
EIS Coordinator

20A The careful reader will notice there is a virtual absence of any analysis of Northern Cheyenne (or Crow) issues in this document. The Northern Cheyenne Reservation is surrounded on three sides by the designated region, and the Crow Reservation is adjacent to it on the west. What little discussion of the Northern Cheyenne Reservation does occur is often glaringly inaccurate or misleading, but this merely reflects the lack of analysis, which is the main point that needs to be addressed in comments on the draft. Since in this case I am familiar with some of the background behind this situation I will address my remarks to it directly first before discussing details.

Correction of details would be meaningful only if there were a decent analysis to start with.

For a period of a year, from Spring 1977 to Spring 1978, the Northern Cheyenne Research Project (NCRP), on the initiative of the Northern Cheyenne Tribe, attempted to participate in the Northern Powder River Basin EIS work by providing analyses of baseline conditions and possible impacts on the Reservation. In then end, while the responsible agencies eventually agreed to let the NCRP work on the project, they refused to budget any money for the work. However, they did contract a great deal of work to other research

20A This EIS is meant to aid decisions on specific coal development proposals only in the designated region. It is not intended to serve as an encyclopedic background study of social and economic conditions in the area.

Both the Northern Cheyenne Reservation and Crow Reservation were excluded from the designated region because of different Federal responsibilities in regard to Indian coal. (See chapter IX, Clarification of Scope and Purpose.) Because there are no current mine proposals on the Reservation, inclusion of the Reservation in the designated region would not have changed the analysis. Similarly, because mining is prohibited on the Ashland Division of the Custer National Forest, its inclusion or exclusion from the designated region is immaterial to the analysis.

The Reservations are included in the analysis: the EIS analyzes all measureable impacts the proposed developments would have on the Northern Cheyenne Reservation. Because those impacts are not expected to be severe, they are not discussed at length, nor are existing conditions on the Reservations discussed in detail.

LETTER 20

groups and to universities. Before the close of the unsuccessful negotiations, however, NCRP representatives attended meetings and kept up on what the EIS teams were doing. During this period I obtained some idea of what went into the EIS, which contributes to my understanding of the final product as represented by this draft.

What I observed during this period was the imposition of the most severe constraints I have ever experienced in the production of any kind of research effort. And they were not constraints dictated by relevant environmental laws or regulations. Environmental law, which sets the framework for inquiry, would have been much better served by allowing room for professional discretion without constant bureaucratic intervention. Instead, what was imposed was an orthodoxy of approach, perspective and direction placed by government officials on the research effort. Such an orthodoxy, by constraining professional judgment and literally censoring legitimate approaches and points of view, has deprived the public of information badly needed for intelligent policy decisions on crucial issues. It also contributed to the nearly one-hundred percent turnover of the professional staff originally on the State team. It was also a major factor in the government agencies' refusal to allow the Northern Cheyenne Tribe a role in the project.

A number of the original members of the State team recognized that it would be important from a professional standpoint to present an adequate review of Native American issues in the impact statement, and to involve the tribes in that presentation. They spoke and wrote letters in support of this position. One of the constraints mentioned above, from the researcher's point of view, was the governmental agencies' refusal to make possible such input. This decision was made before the research was actually begun, and is reflected in the study design itself.

Tribes were excluded from the "designated region" itself, according to the draft EIS (p I-1), because "Indian coal is under the jurisdiction of the individual tribes and the Bureau of Indian Affairs". However the Custer National Forest, Ashland Division, which is comparable to the Northern Cheyenne Reservation in size, and on which mining is prohibited by Federal Statute, was not specifically excluded from the designated area. The exclusion of the Tribes from the designated area and from participation in the study, then, were apparently policy decisions by the State of Montana and the USGS. These decisions require more explanation than that provided in the DEIS.

This draft document took a large research staff three and one-third years to produce, at a cost, according to one estimate, of over a million dollars a year. (If this estimate is way off the mark, I would like a more accurate figure.) The result is not, by the usual professional standards, commensurate with that outlay of time and money. It is not possible now to provide information that should have been part of the research program from the beginning. There is probably no way now for the analyses of impacts to Native American communities in the area to be brought up to professional, or legal, standards of adequacy. However, some of the more glaring bits of misinformation or distortions could be corrected for the Final EIS.

The page numbers in the following refer to the subject draft EIS:

- 20B 1. p. II-77, DEIS. The Indians did not lose the Battle of the Rosebud.
- 20C 2. p. II-77, DEIS. To say that "the Cheyennes were split into two reservations" ignores the role of the Northern Cheyennes in obtaining their reservation, which is very important for understanding its contemporary significance to tribal members. Actually, the U.S. tried to force both groups on to the same reservation in Oklahoma until the Northern Cheyennes fought their way back up north to Montana in 1876. Much more needs to be said in this regard.

20B Correction noted.

20C The information you provide is appreciated.

20D Lowie was misspelled in volume I, p. II-77. The reference to Lowie (1935) has been added to chapter X.

20E Boomtown growth was defined for the purpose of this EIS on page IV-44, paragraph 3. A more exact definition, perhaps based on rates of growth, would have been misleading. Projected growth was compared with past episodes of rapid growth--see page IV-42 and figure IV-12. The description of economic instability in chapter II shows that rapid social and economic changes are not new to the area.

20F Absent evidence to the contrary, we believe our analysis is valid.

- 20D 3. p. II-77, DEIS. There is no reference to "Lowies, 1935" in the bibliography.
- 20E 4. p. II-78-9. The area is characterized here numerous times as having experienced "boom growth" or "unstable economic" conditions throughout its history. This could be misleading unless these terms are defined and unless the text makes some meaningful comparisons/contrasts to the kind of "boom" expected under the proposed actions. It also ignores the relatively stable conditions that made possible the continuation of highly traditional and unique ranching and Indian communities in this area.
- 20F 5. p. II-82. The application of the "arid lands" explanation to the disruptions attending coal development boom growth is particularly trite and unconvincing.
- 20G 6. p. II-93, Fig. II-38. These figures would be much more meaningful if a comparison with the characteristics of non-poverty households were supplied as well.
- 20H 7. p. II-103. To attribute Indian reservation underdevelopment to Indian cultural traditions is grossly inaccurate and prejudicial.
- 20I 8. p. II-103. The Supreme Court did not award the tribe the right to cancel all existing mineral leases.
- 20J 9. p. IV-1. "Study area" needs to be more carefully defined. As defined it could include the entire U.S.
- 20K 10. p. IV-42. Did not Gillette and Rock Springs also have prior experience in "dealing with growth?"
- 20L 11. p. IV-46. It is probably a gross oversimplification, if not wrong altogether, to suggest that coal development in rural areas replaces a rural agrarian lifestyle with an urban-industrial one.
- 20M 12. p. IV-48. Why could not impacts to social units in the impacted area be examined? A range of methodologies, analytical frameworks, and model studies
- 20G Figure II-38 illustrates that a relatively small proportion of the low-income population (the underemployed) could take advantage of coal development. The purpose of this illustration is not to compare poverty versus nonpoverty households. However, a diagram showing nonpoverty households would show a larger concentration of full-time employees and a corresponding decrease in all other categories.
- 20H Nowhere is it stated that the Indian Reservations are underdeveloped--only that they depend even more heavily than the rest of the region on the export of raw materials.
- 20I The comment is correct--the leases are not cancelled, but they are inoperative. The Supreme Court's Hollowbreast Decision in 1976 gave the Northern Cheyenne Tribe control of all reservation coal. The tribe now refuses to allow development of existing leases until terms are renegotiated to the satisfaction of tribal representatives. The sentence referring to the right to cancel leases has been revised.
- 20J The "study area" as defined in the EIS has no definite boundary; instead, it varies with each discipline under consideration. The size of the study area depends on the extent to which anticipated impacts would be significant, even though it may extend beyond the designated region.
- The largest study area probably applies to transportation because the market area for the coal includes the upper Midwest and Texas. The study area for soils and vegetation, on the other hand, encompasses only the minesites.
- 20K The towns of the study area are not likely to experience all of Gillette's and Rock Springs's problems, because they differ in size, economic diversity, and availability of trade and service activities. Also, the towns have greater experience in dealing with growth and more programs available to mitigate impacts.
- 20L The predicted change would be gradual, not sudden or complete. See also 3IV and 35W.
- 20M Although there is some agreement on what the basic social units of the community are (family, government, church, school, clubs, etc.), how they would be affected by growth is not well understood. Research to date has not shown how the social units would be affected or whether they would be able to meet human needs. Consequently, the analysis focused on adverse and beneficial effects on individuals--about which more is known.

could be drawn on for doing so. Without such a study there is no social impact analysis in the EIS.

20N 12. p. IV-51. The discussion of "export" of benefits associated with extractive industries is good. However, again, "area" needs to be defined.

20O 13. p. IV-56. See Comment #7 above.

20P 14. p. IV-56. Surely with the extremely high unemployment rate characterizing the reservation communities, and the numerous jobs that would be opened up by the proposed projects, the assumption that only a few Northern Cheyennes would be hired needs to be examined more closely.

20Q 15. p. IV-61. The success of reclamation efforts should not be assumed here when it is questioned or qualified elsewhere in the document.

20R 16. p. IV-64. Contrary to what is stated here, there does exist the potential for significant land use impacts from the proposed projects on the Northern Cheyenne reservation, depending on the hiring practices of the companies involved. This is particularly true when the so-called "baseline" projects are considered well.

20S 17. p. IV-69. It is extremely unlikely, as any map of the area would show, that increased traffic between Colstrip and Decker would bypass the Northern Cheyenne Reservation to the east. Actual impacts will not somehow magically skirt around the boundaries of the Reservation, as this analysis skirts around Native American issues.

20T 18. p. V-1. It is not entirely clear as of now that Colstrip units 3 and 4 would in fact meet all applicable air quality standards.

20U 19. There are statements in the document that are not wrong in any strict sense, and that are not really objectionable either, but that tend to underplay the importance of the Native American populations of the area. For example, on p. II-80 the DEIS states: "The only substantial minority populations in the study area are the Northern Cheyenne and Crow Indians."

20N The study area in this context comprises the six counties shown in figure I-1.

20O See response 20H.

20P See response 10I.

20Q Reclamation failures or local problems are possible after the company has reclaimed the mine to legal standards.

20R See response 10I.

20S The comment is correct. The last sentence of paragraph 3 on page IV-69 should be changed to read: "Travel between the Colstrip and Decker areas across the Northern Cheyenne Indian Reservation would probably increase slightly--well within existing road capacities."

20T Comment noted. We do not know whether the air quality control equipment proposed for Colstrip units 3 and 4 will enable them to meet applicable air quality standards. Recent approval of units 3 and 4 by EPA suggests that standards can and will be met. See responses 27Q and 27T.

20U You have a valid point. The proportion of Native Americans to the total population of in certain areas would depend on the area delineated. The Northern Cheyenne Reservation is between the clusters of mining at Colstrip and Decker, but none of the proposed developments would be on the Reservation. Impacts from the proposed developments would not be a function of the proportion of a given population being Indian.

LETTER 20

In a subtle way this statement says something quite different than, for example, "Native Americans make up a substantial portion of the population in the study area." The document then observes that the Northern Cheyenne Tribe constitutes about 20 percent of the population of Rosebud County, and the Crows about 30 percent of Big Horn County. Not all Northern Cheyennes reside in Rosebud County, but in any event, these figures are roughly accurate and constitute significant percentages, by any standard. The DEIS does fail to note that the Northern Cheyenne population is concentrated on its reservation in the center of the immediate area in which the proposed projects are located. In fact Northern Cheyennes might be a majority population in the immediate area defined by the proposals (see the map inside the front cover of the DEIS. Although not labeled, the large gap extending into the study area from the left is the Northern Cheyenne Reservation.)

20V

20. One further general comment: the rationale behind the distinction between baseline conditions and the proposed actions needs to be clearly spelled out somewhere in the document, the baseline conditions or actions identified, and this section referenced when the concept is used elsewhere in the document.

The above comments illustrate clearly the lack of analysis of Northern Cheyenne issues in this draft. It needs to be emphasized again that, while the details mentioned above need to be corrected, such correction cannot by any means make up for an analysis that simply is not there. The decision in this EIS will remain ill-informed and sketchy until the Tribes are involved and an adequate analysis is made.

20V Chapter I, pages I-1 through I-6 describe the proposed developments. (See chapter IX, Clarification of Scope and Purpose.) Pages I-7 through I-9 describe existing and projected development which forms the baseline. (See also page IV-1, paragraph 4.) Table I-3 and figure I-2 further identify the baseline and the proposed developments. Baseline conditions include existing and projected developments in order to provide a context for the discussion of impacts from the proposed developments. Impacts under baseline conditions (that is, in the absence of the proposed developments) are given in general terms on pages II-127 through II-130.



WYOMING
EXECUTIVE DEPARTMENT
CHEYENNE

September 7, 1979

ED HERSCHLER
GOVERNOR

Mr. H. William Menard, Director
U.S. Geological Survey
National Center
Mail Stop 108
Reston, Virginia 22092

Dear Mr. Menard:

21A

This is in reference to the two volume draft environmental statement for coal development in the Northern Powder River Basin, Montana, (DES 79-41). The documents have been reviewed by our interested state agencies. Copies of comments and questions provided by our Department of Environmental Quality are enclosed for your consideration and use.

The environmental statement estimates that approximately 75% of the Big Horn County, Montana miners would reside in the Sheridan, Wyoming area. Such a population influx would obviously create socio-economic and environmental impacts in the Sheridan area which would have to be dealt with by Wyoming local and state officials.

The statement also indicated that the south pit of the proposed Pearl Mine will be located directly adjacent to the Wyoming - Montana state line. This proposed location, coupled with the fact that many bio-physical parameters such as drainage areas, surface and underground waters and wildlife migration routes overlap the states boundaries, presents a somewhat unique situation. While the mining is to be conducted wholly in Montana, it appears that many of the potential socio-economic and environmental impacts will occur in Wyoming.

In view of the above, I would like to see the State of Wyoming more directly involved in the analysis of this potential mining plan. There are many questions left unresolved in the draft statement. I believe that these questions can best be addressed through a joint effort involving both the States of Montana and Wyoming and the U.S. Geological Survey. I encourage such an

21A See volume 4, responses to letters 20 and 21.

LETTER 21

Mr. H. William Menard
September 7, 1979
Page 2

effort and request that any further action on this proposal be closely coordinated with my office.

Yours sincerely,


EH:pcd

attachment

cc: Mr. Leo Berry, Jr., Commissioner
Montana Department of State Lands
1625 11th Avenue
Helena, Montana 59601

LETTER 21



THE STATE OF WYOMING

ED HERSCHLER
GOVERNOR*Department of Environmental Quality*

LAND QUALITY DIVISION

HATHAWAY BUILDING

TELEPHONE 307-777-7756

CHEYENNE, WYOMING 82002

Mr. H. William Menard, Director
U.S. Geological Survey
National Center
Mail Stop 108
Reston, VA 22092

RE: Draft Environmental Statement, Shell Pearl Mine, Montana, DES 79-41

Dear Mr. Menard:

The staff of the Land Quality Division, Wyoming Department of Environmental Quality has reviewed the draft Environmental Statement of the Shell Pearl Mine in regard to its environmental effects on Wyoming.

I am concerned that even though an estimated 291 acres will be affected in Wyoming by a rail spur, we were not contacted regarding this proposed project. It should be noted the Land Quality Division is responsible for permitting and enforcement of reclamation laws, including the Surface Mining and Control Act of 1977, for all mining operations in the State of Wyoming.

According to the Draft Environmental Statement, the rail line will affect 291 acres, cross 4 county roads, 1 state highway, and 4 streams in the State of Wyoming alone. There will be considerable impact resulting from erosion along the newly constructed railroad bed and disruption of stream habitat from the construction of the stream crossing structures. Improper fencing of the spur right-of-way may cause disruption of big game animal migratory patterns.

Also, the crossing of the county roads using on-grade crossings will inconvenience and perhaps endanger the traveling public.

I have determined that this proposed rail spur meets the definitions of the Wyoming Environmental Quality Act regarding affected lands and mining-related operations. Therefore, Shell Oil Company will be required to apply for a permit to mine from the Land Quality Division. This will mean for that portion of the rail line located within Wyoming, Shell will be required to salvage topsoil, revegetate the affected areas and fence the rights-of-way to Wyoming standards. The permitting process will also require the posting of a reclamation bond and subject the rail spur construction to the public notice and hearing provisions of the Wyoming Environmental Quality Act.

LETTER 21

H. William Menard
Page Two

Another area of concern is the proposed construction of a diversion channel for Little Youngs Creek which would connect with an existing diversion channel belonging to the Ash Creek Mine. This channel would affect land belonging to the Bureau of Land Management upon which no State permit exists. Construction of this channel would require a permit from the Department of Environmental Quality. Equally, any overstripping which would occur in Wyoming as a result of mining operations in the south edge of the south pit would require a permit and bonding.

Specific comments on the Pearl DES are attached. These comments reflect the Division's concern for potential environmental and agricultural impacts to Wyoming as a result of the proposed operation. I encourage you to contact my staff for more detailed input. Your agency should realize that our processing a permit for disturbances which will occur in Wyoming could result in alternatives to those conditions shown in the DES.

Sincerely,



Walter C. Ackerman
Administrator

MCA:sh
Attachment
cc: Albert Iresom
Shell Oil Company

Leo Berry Jr.
Montana Department of State Lands

Attachment - Comments on Pearl Mine DES, Prepared by the U.S. Geological Survey and the Montana Department of State Lands, 1979.

Following are specific comments on the referenced DES. These comments reflect the Land Quality Division, Wyoming Department of Environmental Quality's concern with the proposed operation as it relates to the responsibilities of the Division and anticipated impacts to Wyoming.

I. RE: Railroad Spur

The 291 acre railroad spur will require a permit-to-mine prior to construction. The railroad alignment, as proposed in figures I-8 and I-9, will cross several streams, one major drainage, county roads, a state highway and lands of agricultural and wildlife importance. Impact to the hydrologic balance also warrants concern. The DES fails to recognize the associated impacts and discuss mitigative measures.

II. RE: Alluvial Valley Floors

The DES does not include discussions on alluvial valley floors. The railroad spur and mine plan, as proposed, will affect alluvial valley floors associated with Little Youngs Creek, Youngs Creek and the Tongue River. Alluvial valley floors on Ash Creek and Prairie Dog Creek, should they exist in the area of disturbance, could also be impacted.

III. RE: Adjacent Mines

The Pearl Mining operation shall be conducted adjacent to the Ash Creek Mine which is located in Wyoming (see the attached map). The DES fails to describe the accumulative impacts of the two operations nor does it describe procedures whereby the two operations will be conducted and reclaimed in a consistent manner. Areas requiring specific evaluation include:

1. Accumulative impacts to and restoration of the hydrologic balance.
2. Preservation of essential hydrologic functions and material damage to alluvial valley floors on Little Youngs Creek and Young Creek.
3. Restoration of the essential hydrologic functions on Little Young's Creek.
4. Dewatering effects on Little Youngs Creek and the Ash Creek Mine Diversion.
5. Blending of final contours and land uses.
6. Selective handling and disposal of saline-sodic spoil in the mine area.

IV. RE: Relocation of County Road

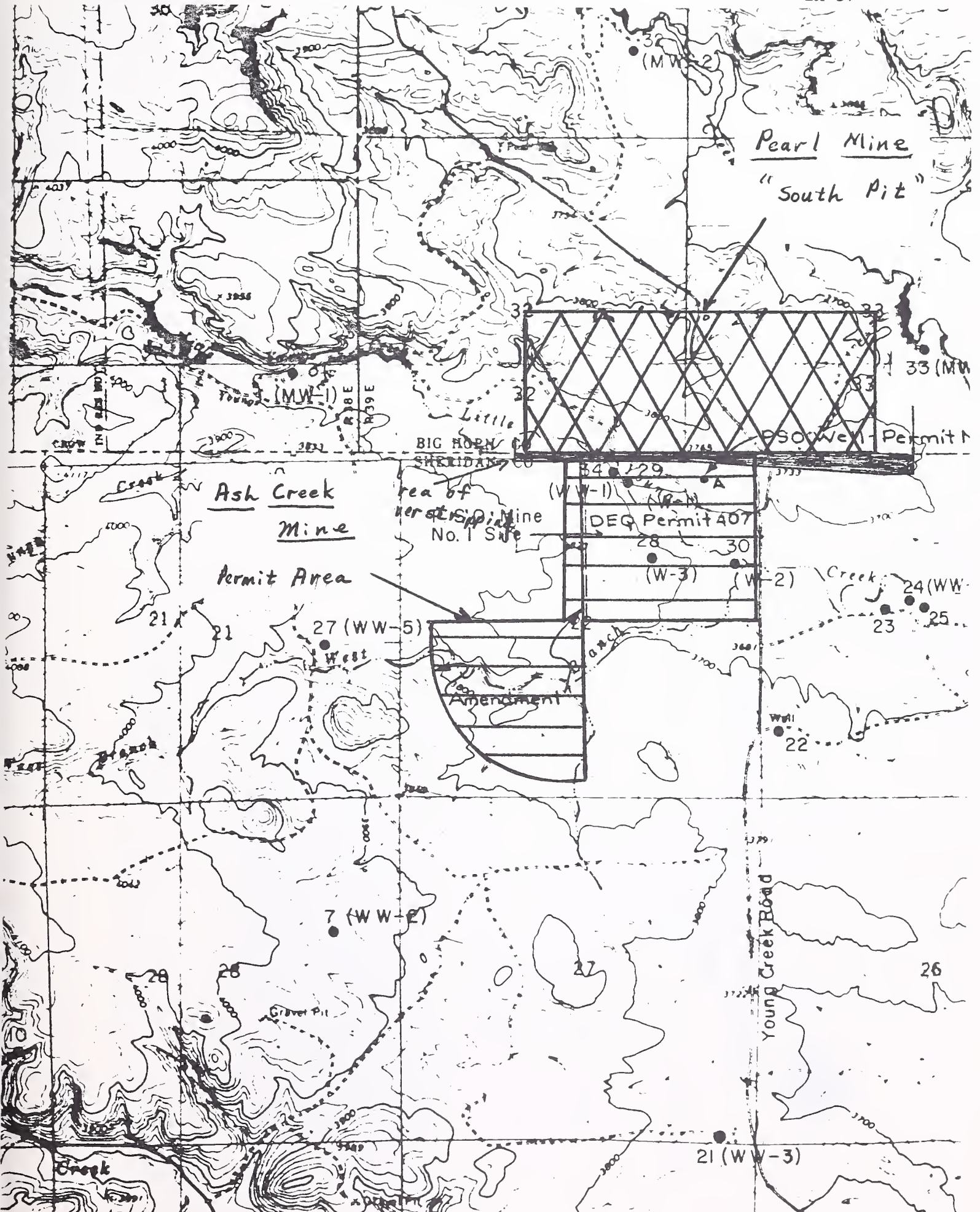
The "old county road", as shown on Figure I-7, is improperly shown in the southeast portion of the figure. The existing road runs along the section lines of sections 22 and 23.

LETTER 21

The proposed "relocated county road" would diagonally cross crop and hay-lands associated with the Little Youngs Creek drainage, (Section 23) disrupting the use of these lands for intensive agricultural purposes. Alternative routes should be investigated.

V. RE: Overburden Quality

The Division has found anomalously high levels of DTPA extractable lead and has required Ash Creek Mine to specially handle these materials. The stratum of high lead are generally associated with the saline-sodic materials of the overburden.



LETTER 21

THE STATE
OF WYOMINGED HERSCHLER
GOVERNOR

Department of Environmental Quality
Water Quality Division

HATHAWAY BUILDING

CHEYENNE, WYOMING 82002

TELEPHONE 307 777-7781

M E M O R A N D U M

TO: Robert E. Sundin, Director, Department of Environmental Quality

THROUGH: William L. Garland, Administrator, Water Quality Division *WLG*

FROM: A. J. Mancini, Environmental Engineer, Water Quality Division

DATE: August, 17, 1979

SUBJECT: Comments on Draft Environmental Statement, "Proposed Mining and Reclamation Plan, Pearl, Mine, Big Horn County, Montana".

The Pearl Mine is a proposed surface coal mine in southern Montana, in the vicinity of the State line between Wyoming and Montana. The "south pit" for the proposed mine apparently will be constructed on the State line.

Reportedly, a revised plan has been submitted, to reflect requirements of new regulations, but has not yet been reviewed by the Office of Surface Mining and the Montana Department of State Lands.

Since the south pit is shown as being on the State line, it might be anticipated that there would be some coordination of regulatory authorities in Montana and Wyoming; however, there is no indication of this, other than a request for comments from the Office of Governor Herschler. If there are coal lands in Wyoming adjacent to the south pit, these lands will be affected by activities in Montana. As an example, the E S includes (Figure I-14) a map showing postmining contours for the south pit. Contour lines stop at the State line (reclamation could and probably will affect lands in Wyoming even if these are not coal lands).

Table II-1, on page II-5, indicates that there is a Federal livestock standard for nitrate-nitrogen in water; I have not been able to verify this, and doubt if there is such a Federal standard. Verification or correction in the E S is required.

An analysis of social impacts in the E S indicates a significant impact to Sheridan County (Wyoming), and a decline in the well-being of persons living in the area. In view of this and a previous observation concerning mining on the State line, I believe the State of Wyoming should be directly involved in an analysis of the mining application.

LETTER 21

Memo
Robert E. Sundin
August 17, 1979
Page 2

There is a topic which is not covered in the E S, and should be discussed so as to complete an evaluation of impacts to water resources. This topic is the Yellowstone River Compact, the signatory States being Wyoming, Montana and North Dakota. What effect will the impacts to surface water resources have on Wyoming's allocated water of the Tongue River drainage?

Closely related to this topic is a question of the affect on the water quality in Wyoming, since Wyoming is "down-stream" from the mine. Will the operator have to meet Wyoming water quality standards? Will groundwater quantity and quality on the Wyoming side of the State line be monitored? Will the State of Montana provide Wyoming with data obtained by a monitoring program on the Montana side of the State line?

/jn

LETTER 21



THE STATE OF WYOMING

ED HERSCHLER
GOVERNOR

Department of Environmental Quality
Water Quality Division

HATHAWAY BUILDING

CHEYENNE, WYOMING 82002

TELEPHONE 307 777-7781

M E M O R A N D U M

TO: Robert E. Sundin, Director, Department of Environmental Quality

THROUGH: William L. Garland, Administrator, Water Quality Division *WLG*

FROM: A. J. Mancini, Environmental Engineer, Water Quality Division *ajm*

DATE: August 17, 1979

SUBJECT: Comments on Draft Environmental Statement, "Northern Powder River Basin Coal, Montana".

21B

There isn't much in this statement concerning water resources which relates to Wyoming. Chapter IV, "Impacts", does include estimates of potential impacts to Sheridan, Wyoming. It appears that Sheridan might have to obtain storage space for water, to prevent impacts on downstream (Montana?) water users because developments in Montana will require more municipal water to be provided by Sheridan. The State of Wyoming would want to keep abreast of Montana developments which cause an increase in Sheridan's population. If new water storage is needed, perhaps it could be constructed to store "Montana water" that normally would be stored in the Tongue River Reservoir.

21B See volume 4, responses to letters 20 and 21.

/jn

Dear friends,

22A I am totally and irrevocably opposed to coal development in the Northern Powder River Basin. We have no right to tear up the earth and deplete the resources as if we are the only generation that ever walked on this earth.

Thank you

Andy P. Barston

Andy P. Barston
P. O. Box 8864
Missoula, MT 59807

(copy)

22A Your views are noted. The coal companies whose proposals are analyzed in this EIS have the legal right to mine coal on their leaseholds, provided they comply with all applicable laws and regulations.

LETTER 23



FRIENDS OF THE EARTH, INC.

Director, U. S. Geological Survey
National Center, Mail Stop 108
Reston, Virginia 22092

XXXXXXXXXX SAN FRANCISCO CALIFORNIA XXXXX
Box 882 Billings, MT 59103
September 1, 1979

RE: DES NPRBC, Montana

Dear Sir:

23A

Enclosed is a copy of my letter of September 6, 1977, to Undersecretary James A. Joseph in critique of the original arbitrary choice of NPRBEIS boundaries. By letter of Feb. 28, 1977, to Governor Judge, Acting Assistant Secretary Bettenberg justified the refusal to include the Crow Ceded Area within the scope of the NPRBEIS on two points: such inclusion "...would give rise to the problems inherent in combining a discussion of tribally owned coal with the development of Federal and State coal.", and "...the Westmoreland Resources lease and mine in the Sarry Creek area is the only currently proposed development on the Indian coal of the Ceded Area." As to the first point, the fact that both state-owned and Crow-owned coal have always been a part of the Westmoreland Resources 20-year mining plan did not dissuade the Ninth Circuit Court of Appeals from ordering that comprehensive impact statements be prepared. 527 F2d 786. In fact, USGS FES 77-17 addresses the cumulative impacts of mining both Crow and state-owned coal by Westmoreland. Bettenberg's second point lost credibility four months after its making when a front page article in the Billings Gazette, July 11, 1977, stated that "...the Crow Tribal Council voted to accept a proposal for coal mining venture with AMAX...on 4,000 acres of Crow ceded land...", yet the Crow Ceded Area remains unincorporated in the DES.

Inclusion of the Crow Ceded Area within the NPRBEIS would provide an excellent opportunity to review the critical East Fork Sarry Basin within the context of the entire region, as suggested in my letter to Mr. Joseph, thereby providing an appropriate forum for evaluation of uniqueness - an evaluation heretofore avoided in FES 76-64 covering the Westmoreland 30,000-acre lease area and FES 77-17 covering the Westmoreland 20-year mining plan, as outlined in Assistant Secretary Davenport's letter of March 3, 1978, to the Environmental Protection Agency (enclosed).

Friends of the Earth sees no alternative but to litigate the procedural adequacy of the NPRBEIS unless its boundaries are expanded to allow for a proper evaluation of the regional uniqueness of the East Fork Sarry Basin and the proposed Westmoreland expansion. Such evaluation should also include the Northern Cheyenne Reservation, as there are many unsubstantiated claims that areas similar to the East Fork Sarry Basin abound on the Northern Cheyenne Reservation and in the Custer National Forest, and the Northern Cheyenne have requested to be included within the study area.

Respectfully yours,

Edward M. Dobson
Edward M. Dobson
Northern Great Plains Representative

encl (2)

Please enter both enclosures and this letter as part of the comment record on the Draft Environmental Statement, NPRBC, Montana.

c: Governor Tom Judge
Mr. Dewitt Dillon, Crow Tribe
Mr. Tom Osborne, Northern Cheyenne Research Project
Bruce J. Terris, Esq.

23A

Westmoreland Resources, Inc.'s, Abslola mine is treated as an existing mine in this EIS and is part of the baseline conditions discussed on pages 11-127 through 11-130. Site-specific evaluation of Westmoreland's plans for expansion of their mine is not appropriate in this EIS, except to the extent that land disturbed there would contribute to cumulative land disturbance in the northern Powder River basin. (See chapter IX, Clarification of Scope and Purpose.)



FRIENDS OF THE EARTH, INC.

529 COMMERCIAL SAN FRANCISCO CALIFORNIA 94111

The Honorable James A. Joseph
Undersecretary of the Interior
Department of the Interior
Washington, D. C. 20240

RE: EGS-213620-MS760
S-19148

P. O. Box 882
Billings, MT 59103
September 6, 1977

Dear Mr. Secretary:

Today I received a copy of your July 21 rejection of the Mid-Yellowstone Areswide Planning Organization's (as per Section 208, Federal Water Pollution Control Act, 1972) request to include the Crow Ceded Area within the Northern Powder River Basin environmental impact statement (NPRBEIS), a request made earlier by the Governor of Montana, more recently by the Montana Department of Natural Resources, and recommended by USGS' Menlo Park staff by memo of November 24, 1976. Such rejection has resulted in Secretary Andrus' erroneous conclusion of August 9 that the lower East Fork Sarpy Basin has been found not to be unique as alleged in comments for Friends of the Earth to USGS on July 15 by Gary Watson. By letter of August 25 to Secretary Andrus, Montana's Department of Natural Resources and Conservation points out such error in the Secretary's August 9 approval of the 20-year mining plan of Westmoreland Resources.

Further, by letter of August 24 EPA Region 8 (Denver) has reiterated its conclusion regarding inadequacy of the USGS 20-year mining plan EIS (FES 77-17). Meanwhile, by letter of August 9 to EPA, USGS contends that Montana law will not require Westmoreland to restore water supplies such as springs and wells destroyed by mining because Westmoreland owns the land. Please expect that USGS may be adjudicated to have been in error in that regard.

Friends of the Earth intends to pursue enforcement of all applicable laws regarding Westmoreland, including NEPA. We are encouraged by the Menlo Park recommendation as above, as the Crow Ceded Area is not within the Crow Reservation and the Crow Tribe is clearly a private owner of coal in that area, albeit subject to federal sanctions. Any decision not to include the ceded area in the NPRBEIS is clearly not substantively supportable, however politically and administratively supportable it may seem. We expect further to pursue the failure of Interior to address the possibility of an exchange under Section 206, PL 94-579, by which the Crow Tribe would receive royalties, and we have recommended by letter of July 15 to USGS that federal coal at Decker, for example, be so exchanged. By letter of August 31 to Secretary Andrus we have requested rescission of the Westmoreland approval, circulation of a draft addendum to USGS FES 77-17 incorporating and responding to all comments received on that FES, and inclusion of the Crow Ceded Area within the NPRBEIS in order to satisfy the requirements of NEPA, of the state of Montana, and the question of uniqueness of the truncated aquifers, springs and wells, and organic and subirrigated soils of the upland drainages (see Watson as above) of the lower East Fork Sarpy Basin.

With all due respect I sincerely request that future decisions not be based upon the unsubstantiated claims of one point of view.

Best regards,

Edward M. Dobson

Edward M. Dobson
Northern Great Plains Representative

copy to Secretary Andrus
and media

LETTER 23



United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

In Reply Refer To:
EGS-Mail Stop 108

Mr. Peter L. Cook
Acting Director
Office of Federal Activities
U.S. Environmental Protection Agency
Washington, D.C. 20460

Dear Mr. Cook:

In response to your letter of December 19, 1977, expressing several concerns over our approval of the Westmoreland Resources Mining plan for Tract III of the Crow Ceded Area, Montana, please be advised that we have given the matter our careful thought.

Concerning your discussion of "unique hydrologic characteristics," we did not intend to imply that EPA had conducted its investigation to evaluate that claim. Our intent was to indicate that our reading of EPA's independent report revealed nothing that would suggest the presence of "unique" conditions, as indeed our own data and studies failed to suggest. Neither did we intend to comment on or appraise local hydrologic conditions in the context of State law and requirements relating to "uniqueness"; that is the function and responsibility of the Montana State Land Department (MSLD). We have no reason to believe that MSLD will fail to fully exercise their responsibility at such time as the area in question comes under the purview of State permitting action in the years ahead; presently no such action is pending before MSLD. We do not believe that a review of this matter as you request is thus warranted.

The Westmoreland plan met the requirements of Federal law and regulation in force at the time of approval. Subsequently, of course, the Surface Mining Act has come into being, and by the terms of the lease, any final revisions to 30 C.F.R. 211, will be applicable to the Westmoreland mine. Also, initial program requirements are applicable pursuant to 25 C.F.R. 177-B.

-2-

of necessity under the new law and regulations the Company is reviewing its present plan for conformity therewith. It seems likely that substantial additional information will be required of Westmoreland and other operating companies, and that many will be required to modify their presently approved plans. At that time all reclamation and hydrologic protection requirements of Federal regulations and Westmoreland's submittals will be carefully reviewed, and your specific concerns carefully considered in light of those regulations.

Sincerely yours,

(Sgd) Joan M. Davenport

Assistant Secretary of the Interior

cc:

Commissioner, Montana State
Land Department
Director, Geological Survey
Director, Office of Surface Mining
Regional Administrator, EPA,
Denver, Colorado
President, Westmoreland Resources,
Billings, Montana

LETTER 24

R.E: Comments on Draft Environmental Statement: Northern Powder River Basin Coal.

I would like to take this opportunity to express my feelings on the reclamation of coal mine lands in Montana. In my opinion, reclamation is an inexact science in its early stages of development, yet is being considered by many people as a proven success because of the apparent ease in establishing vegetative cover on strip mined lands. A number of factors will determine the ultimate long term success or failure of reclamation in the Powder River Basin and few if any of these factors are adequately addressed in the E.I.S. or in other E.I.S.'s for specific mines. Erosion is one factor that is not adequately addressed. In the mining process all natural barriers to erosion are completely destroyed and all rock layers and hard pan layers are completely pulverized making the resulting soils permanently and highly prone to erosion. Slopes such as the minimum of 5 to 1 simply will not stabilize this soil and it sooner or later will develop gullies. Periods of drought, which are typical in this area, will greatly reduce or destroy plant cover and create ideal conditions for erosion. Where all rock layers or hard pan layers have been destroyed by mining there will be nothing to limit or stop this erosion and it will eventually destroy the reclamation on the mined area and through siltation will ruin vast areas downstream from the mined area. It is possible that siltation in such streams as the Rosebud, Armells Creek, Sarpy, Tongue and Powder Rivers would permanently alter these streams and greatly reduce productivity in their valleys. I have observed reclamation efforts on a number of mining operations for a number of years and if the slope factors aren't given adequate attention I foresee the possibility that nearly all the strip mining reclamation will turn out much like Western Energy's Pit 6 and Pit 6 extension. This is the area that the Department of State Lands termed a total failure in a letter to Western Energy. In that area erosion of slopes is destroying both the higher ground and through siltation the lower, more level ground. Although many of the factors involved in erosion control are

24A

Volume 1 does not assume that reclamation will be successful on all mined lands. See for example chapter II, Soils, Reclamation Potential; chapter IV, Geology, Topography and Geomorphology; and chapter IV, Soils, Long-Term Reclamation Problems.

Erosion of reclaimed surfaces is also considered in chapter IV, Soils. The erosion problems cited in the comment could occur locally on reclaimed minesites but are not likely over large areas under the proposed mine plans.

mentioned in the E.I.S., no truly adequate measures are proposed to eliminate these factors. After years of observations of reclamation I am convinced that slopes greater than 10 to 1 are doomed to eventual failure. The only reclamation I have seen that showed promise of long term success is at the Decker mine where the spoils have been nearly leveled and even then there are problems with piping and slumping plus sheet erosion on the areas of sloping ground.

24B Another factor that could well be serious is the damming of underground aquifers when the spoils are returned to the pits. In some of these mining operations these dams are going to be miles thick and I am convinced that these natural water flows are not going to be reestablished through these spoils. Eventually these underground flows are going to be forced to the surface creating vast areas of saline seep. I believe that some provision should be made to protect and preserve the natural flows in their original courses through such measures as rock and gravel conduits in the bottom of the pits before the spoils are returned. This would also help maintain the present underground water and could possibly eliminate the saline seep problems. The underground flows of water in this area are usually very slow, but are also very persistent and it may be years before this problem develops into a serious threat to reclamation, but I am sure it eventually will.

24C Piping, slumping and the development of underground voids will always be a serious problem on these mined lands unless compaction of the spoils from bottom to top are required.

24D The use of introduced species of plants in reclamation will eventually cause problems in the management of these restored areas. Having worked with both native and introduced species of grass and legumes in my ranch operation, I have found that most introduced species will produce very well for a limited number of years and then their production will decline steadily until they are no longer of economic value to a ranch operation and must be plowed up and replanted while native species are so perfectly adapted to both climate and soils that they continue to produce permanently and on a self sustaining basis. I am convinced that extensive use of introduced species will

24B Studies by the Montana Bureau of Mines and Geology (Van Voast and others, 1977) indicate that mine spoils transmit ground water at about the same rate as undisturbed coal beds. Thus, damming of ground-water flow by returned spoils is not anticipated.

24C We agree that surface subsidence phenomena (piping, slumping, and the development of voids) are a long-term problem of considerable concern. To date, the problem has been local and is usually related to poorly planned and executed regrading. This is especially true of piping on excessively steep slopes. Given sufficient time, subsidence may develop into a greater problem, although a recent study of subsidence of coal mine spoils at Colstrip (White and Farrow, 1980) has not found subsidence of the railroad which was built in 1968 on an area mined during the 1940's. Mined lands in the region are being surveyed for permanent transects to monitor subsidence.

24D The companies are required to use a mixture of native and introduced plant species. The introduced species help control erosion on the regraded slopes.

Current reclamation requirements are discussed on page III-12, paragraph 1. The probability of successful revegetation is discussed in chapter IV, Vegetation. Declines in productivity generally follow unusually high initial productivity (see figure IV-10) after which, under proper management, potential productivity stabilizes at levels close to the potential before mining. Actual productivity would be somewhat less than potential (before and after mining) and would depend on the level of management. See response 29G.

LETTER 24

eventually lead to failure of reclamation and due to the characteristic of the spoils their production declines will be much faster and more dramatic than it usually is when these species are used for planting of abandoned fields. The reasearch work done at MSU point up very dramatically the production decline of introduced species on spoils.

I have been pointing out what I feel are deficiencies in this E.I.S., but I do feel that on a whole it is a well developed document and has much to commend it. My particular interest is the reclamation of mining lands as I feel that the future of eastern Montana depends very much on the success or failure of reclamation and I have been alarmed to have seen it dismissed by many people as a proven success when it definitely is not as yet and is at best a developing science. I think that my concern about reclamation is justified by such things as the Final Environmental Statement on Federal Coal Management in which two pages of a total of 1230 pages are devoted to reclamation.

Bill Gillin
Route 2
Forsyth, Montana

Testimony: Public Hearing

Subject: Draft No. Powder River EIS

Date: August 22, 1979

Patty Kluver
Rosebud creek rancher

I want to thank you gentlemen for coming to Forsyth to conduct an open hearing relating to the recently published Draft Powder River EIS. You have completed one of the better publications relating to strip-coal-mining, and commendation is due.

There hasn't been time to do a complete critique of subject, but it will be sent in as written testimony before the Sept. 7th deadline.

25A There are two subjects I would like to address orally. The first is the chapter on Social and Economic impacts, attached to industrialization of the Great Plains.

You have sent out teams to conduct interviews at the homes of the people who have lived in this region lifetimes, as had their grandfathers, and great grandfathers. By asking a few inane, if I may say so, questions, you imagine you know and understand the simple folk of this area.

There is an old Indian saying, "Never judge a man until you have walked a mile in his moccasins," and it is particularly fitting at this time. From your interviews and research, you have barely scratched the surface of the impact of coal mining, and it's accompanying Industrialization on our beloved Great Plains. Why? so that people who have mocked, ridiculed, and written myths about this region might have gas for their cars, or air conditioning for their homes and offices.

We are Americans, with the same Human Rights as those President Carter refers to in his public addresses. We do not think we are any more expendable than the boat people our nation imports daily.

25A

The social sciences are inexact, and the social impacts of industrialization of rural areas are not fully understood. The best information available was used for analysis in this environmental statement, and all comments critiquing the analysis have been carefully considered.

Your views on energy needs are noted. The proposed mines would be on lands already leased specifically for coal mining. No environmental impacts severe enough to preclude mining have been identified; thus, the decision now to be made is how--not whether--to mine.

LETTER 25

A few days ago, a man of much wisdom said to me, "The man who bought the first automobile for his youngster to drive to school should have been hanged." When there are no second and third cars in the driveways of cities and suburbs of America, then, and only then will we who oppose the destruction of this land to alleviate an Energy Crisis, only then will we concede there really is one.

The Energy Industry and the Federal Government have spoken from both sides of their face. On the one hand they tell us there is to be a shortage of electricity and the accompanying benefits, while on the other hand, they are constantly promoting imported electrical appliances; electrical heat; all the most extravagant uses of Energy.

If the money & material wasted, deliberately buried in the garbage dumps of the conglomerates who aspire to destroy the No. Powder River Basin, if that money was instead put into alternate, renewable forms of electricity, those Corporate promoters wouldn't have "leg to stand on."

We don't believe our "life-style" should be sacrificed so that our fellow Americans can throw their aluminum cans along the length and breadth of United States roadways.

Our human rights are just as vital to us as those who live where there is no stripable coal. We request your immediate attention.

25B In another chapter of your EIS, P. II-18, is this quote: "Industrial waste water from the various sludge ponds at Colstrip may be recharging the ground-water system, but no adverse effects due to such recharge are known."

The only reason those adverse effects remain unknown are because there has been no investigation.

During the early part of this decade, the well at our ranch house

25B Investigations of the effects of liquid waste disposal on ground water at Colstrip (Botz, 1978) indicate that "based on presently estimated pond seepage rates, long-term overall impacts of water in the Colstrip area probably will not be measurable in streams, ponds, or ground water except in the near vicinity of the ponds." Waste ponds at the Colstrip generating plant are sealed to minimize seepage into the ground-water system. According to Botz (p. 4), "water level observations and chemical analyses of water from the monitor wells for the past 1-1/2 years has shown the McKay coal seam aquifer to be unaffected by the plant ponds, however, the McKay overburden may be receiving an estimated 5 to a maximum of 15 gpm of seepage from the ponds near the plant."

Other man-induced sources of recharge to the ground-water system in the Colstrip area include the surge pond (storage reservoir for water piped from the Yellowstone River), the sewage treatment plant, and irrigated lawns. Effluent from the surge pond does not pose a threat to surface- or ground-water quality. On the contrary, being derived from the Yellowstone River, it would tend to improve the quality of ground water (Botz, 1978).

Perhaps the most severe impact from increased recharge of the ground-water system at Colstrip is one of quantity instead of quality--see response to letter 26 from J. R. Lee.

Your letter does not indicate the aquifer from which your well obtains water. If the aquifer is alluvium along Rosebud Creek, the quality of water in your well would be generally lower than the quality of water in Rosebud Creek.

The mines at Colstrip have been in existence for a much shorter period than would be required for ground water to move the approximately 8 miles through a continuous coal aquifer from the Rosebud mine to your well. It is therefore highly unlikely that the mineralized readings in your well are due to mining. Assuming a hydraulic conductivity of 0.5 foot/day for coal, as given by Van Voast and others (1977), and a hydraulic gradient corresponding to the 1° (or less) average dip of coal beds, as interpreted from a map showing the structure of the Rosebud coal near Colstrip (Van Voast and others, 1977, plate 1), it would require about 100 days for ground water to move 1 foot. (Hydraulic conductivity is expressed in terms of a hydraulic gradient of 45°.)

became, at times, unpalatable. We decided that the casing must be cracked; that surface water was getting in, so, in 1974, we drilled a new well to the same artesian vein. Accompanying this oral testimony are tests made by a reputable firm, which will indicate the quality of the water in the well in 1976.

On May 20th, this year, I requested the State Water Quality Bureau take another sample, and it is also attached to this statement. It will indicate the marked change in the mineral content of the water.

For example: On Dec. 4, 1976, Magnesium registered 8. In July, this year, this same well registered Magnesium at 204 mg/L. Hardness went from 46 to 1250 mg/L.

Today, there is a well drilling rig at our ranch. It struck the surface water we have so long enjoyed, only to find that it was not fit to drink. They have been drilling, down to 700 feet when I left the ranch.

At \$8. a foot, you may be assured we won't have to worry about Income Tax deductions, this year.

After surviving the hard winter of 78 and 79, our ranch is hardly in a position to assume the enormous cost of drilling to 700 feet or below.

25C To whom do you think we should look, having lost that shallow vein. Who will compensate us for this unsolicited, unjustified expense? If you know the answer, I'm listening!

Thank you, gentlemen

Patty Kluver

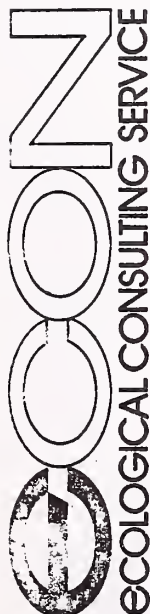
(copy)

Thus, for ground water to move 8 miles would require more than 11,000 years. The hydraulic conductivity of undisturbed overburden at Colstrip is about three times that of the coal (Botz, 1978). Under the same hydraulic gradient, it would take more than 3,800 years for ground water to move through the overburden from Colstrip to your well.

25C Your well would have to be monitored, or test wells dug, to determine the source of the mineralized readings.

SAMPLE: PATY KUNNE WOODSAMPLE DATE: 7/11/79 DATE COMPLETED: 7/20/79

NO.	PARAMETER :	UNITS :	VALUE :
1	pH	STANDARD UNITS	7.60
2	CONDUCTIVITY	μmhos	3200
3	ALKALINITY, TOTAL	mg/L AS CaCO_3	506
4	HARDNESS, TOTAL	mg/L AS CaCO_3	1250
5	CALCIUM	mg/L	165
6	MAGNESIUM	mg/L	204 165
7	SODIUM	mg/L	345
8	CHLORIDE	mg/L	13.5
9	SULFATE	mg/L	1690
10	IRON	mg/L	1.55
11			
12			
13			
14			
15			



ECON INC.
Airport Way Building West
1300 Block, Cedar Street
Helena, Montana 59601
Telephone
406/442-4650

client

Mrs. Pat Kluver

(P. O. Box)

(Street Address)

(City/Town) (Zip Code)

Send Lab Report to Attention of: _____
(2 copies of Lab Report will be sent to client unless
otherwise specified here:)

Econ Inc. LAB NO.

Econ Inc. PROJECT NO.

Econ Inc. INVOICE NO.

Client PURCHASE ORDER NO.

TYPE OF SAMPLE well home home SAMPLE
(*Type*) (*Location*) TAKEN BY: Chad Martin
DATE SAMPLES 10/27/76
RECEIVED: _____

PARAMETER

ppm:

Temperature (°C).....	4	
Ammonia (as N).....		.72

pH..... 8.7 Nitrate (as N)..... .0

Turbidity (JTU).....
Nitrite (as N).....024

Specific Conductance (micromhos)... 2024... 37

Sulfate.....	345
ppm:	---

Total Dissolved Solids.....	1349	Aluminum.....	1
-----------------------------	------	---------------	---

Total Nonfilterable Solids	2.96
Fluoride.....	2.96

(Total suspended solids).....	2.0	
Total Iron.....		.05
Dissolved Oxygen.....		

Dissolved oxygen.....	_____	_____
Silica.....	_____	8.26
Alkalinity (as CaCO ₃).....	_____	_____

Chromium Hexavalent.....	448	.00
Ricarbonate		.07

Carbonate.....40

Chemical	Concentration
Hydroxide.....	0
Boron.....	0

Total Hardness (as CaCO ₃).....	46
Cd(II) III.....	46

Calcium (as CaCO_3).....	22	colpet.....
	22	colpet.....

Magnesium (as CaCO_3)..... 24

Chloride.....

.....

St. John & Mary, Paris

[illegible]

*From conductivity.

CHT:MIST

had plenty

DATE 12

Environmental Applied Research • Wildlife Baseline & Monitoring • Aquatic Baseline & Monitoring • Natural Resource Surveys & Analyses • Air & Water Quality Search • Environmental Impact Assessment

ECS FORM 2

LETTER 25

ECOLOGICAL CONSULTING SERVICE

LABORATORY REPORT

ECON INC.
Airport Way Building West
1300 Block Cedar Street
Helena, Montana 59601
Telephone
406/442-4650

Client

Mrs. Pat Kluver

(P. O. Box)

(Street Address)

(City/Town)

(Zip Code)

Send Lab Report to Attention of:

(2 copies of Lab Report will be sent to client unless
otherwise specified here:)

Econ Inc. LAB NO.

Econ Inc. PROJECT NO.

Econ Inc. INVOICE NO.

Client PURCHASE ORDER NO.

DATE SAMPLES RECEIVED: 12/4/76

SAMPLE TAKEN BY: Chad Martin

TYPE OF SAMPLE well home (Location)

PARAMETER

ppm:

Temperature (°C).....	9.5	Ammonia (as N).....	.66
pH.....	8.4	Nitrate (as N).....	6.8
Turbidity (JTU).....	7.8	Nitrite (as N).....	.00
Specific Conductance (micromhos)...	1466	Orthophosphate.....	.13
	ppm:	Sulfate.....	325
*Total Dissolved Solids.....	978	Aluminum.....	.15
Total Nonfilterable Solids.....	.8	Fluoride.....	1.43
(Total Suspended Solids).....	1.4	Total Iron.....	.33
Dissolved Oxygen.....	1.4	Silica.....	7.9
Alkalinity (as CaCO ₃):		Chromium Hexavalent.....	.00
Bicarbonate.....	451	Zinc.....	.04
Carbonate.....	20	Boron.....	
Hydroxide.....	0	Cadmium.....	
Total Hardness (as CaCO ₃).....	20	Copper.....	
Calcium (as CaCO ₃).....	12	Lead.....	
Magnesium (as CaCO ₃).....	8	Manganese.....	
Chloride.....	18	Potassium.....	
		Sodium.....	

*From conductivity.

CHEMIST Chad Martin

DATE 12/20/76

Environmental Applied Research • Wildlife Baseline & Monitoring • Aquatic Baseline & Monitoring • Air & Water Quality Research • Environmental Impact Assessments
Applied Remote Sensing • Natural Resource Surveys & Inventories

20.5 20.5 1 2



Department of Health and Environmental Sciences

STATE OF MONTANA HELENA, MONTANA 59601

A. C. Knight, M.D., F.C.C.P.
Director

August 3, 1979

Ms. Patty Klurer
Rte 1, Box 24
Forsyth, MT 59327

Lab. No.	1122	F.I. No.	4337
Town	Forsyth	County	Rosebud
Date Collected	7/31/79	Sample from	Well
Owned by	Genie Land Co.		
Collector	Patty Klurer		
Address			

Reference is made to the above sample of water submitted to our laboratory.

The laboratory examination of this sample showed no evidence of contamination. This indicates that, as far as can be determined by a laboratory examination, the water was safe for drinking at the time the sample was taken. However, these results cannot be relied upon as indicating the safety of the water at all times unless the source is properly located and maintained.

Any well construction which does not positively exclude all surface and subsurface contamination must be considered as dangerous to health.

All dust, pump spillage, surface drainage, bird droppings, scrapings from one's shoes, etc. must be prevented from entering the well.

This examination does not include tests for hardness, minerals, iron, fluorides, etc. nor does it include tests to determine suitability for irrigation or for stock purposes.

Sincerely yours,

A. W. Clarkson

A. W. Clarkson, P.E.
Water Quality Bureau
Environmental Sciences Division
Phone No. 449-2406

AMC:wa
F.S. No. 15
cc: Mr. Mark Stevens
Box 1056 - Courthouse
Forsyth, MT 59327

LETTER 26

J. R. Lee
P. O. Box 23
Forsyth, MT 59327
Phone (406) 356-7574
August 13, 1979

Mr. Cecil Andrus
Secretary of the Interior
Washington, D.C. 20000

Dear Mr. Andrus:

Enclosed please find copies of several letters written pursuant to water-flow problems, north of Colstrip, Montana, occasioned by surface coal mining and waste-water treatment operations in the area. As of today no affirmative corrective measures have been taken; however, several people, representing different agencies, have been out to my ranch to view the situation.

Pursuant to the Surface Mining Control Act, 30 U.S.C. 1271(a)(2), I provided the enclosed notice of these problems to Mr. Alan Merson, Regional Administrator of the E.P.A. Upon his recommendation I am providing notice to you of the same.

26A As the cessation of surface coal mining at Colstrip, Montana is impractical, and would not necessarily completely abate the current damage and imminent danger of further significant environmental harm to my, as well as others', land and water resource, I request that you, the Secretary of the Interior, impose affirmative obligations on the operators requiring them to take whatever steps you deem necessary to abate the damage and danger, pursuant to the authority vested in you by 30 U.S.C. 1271(a)(2).

26B I further request that you, the Secretary of the Interior, oversee, pursuant to 30 U.S.C. 1271(b), the Montana Water Quality Bureau, and force affirmative abatement of the damage and danger before any water discharge permits be issued, in line with the Federal Water Pollution Control Act, 33 U.S.C. 1151-1175, and any State Program authorized by 30 U.S.C. 1253.

I will appreciate your attention to this significant problem.

Sincerely yours,

J. R. Lee

26A Your concern is understandable and is best addressed to the appropriate regulatory authorities as you have done. Van Voast and others (1977, p. 39) recognized the problem of waterlogging in parts of East Fork Armells Creek as being potentially long term, although local--"some possibility exists of increased 'waterlogging' in already affected areas along Armells Creek downstream from the project area. No such condition [of increased waterlogging] is known, and no such possibility is expected in any of the other drainages."

26B The rising water table in alluvium of East Fork Armells Creek cannot be ascribed entirely to coal-related development at Colstrip. Rising water levels have been observed in wells upstream from Colstrip and in other valleys, suggesting that increased precipitation during the past several years has contributed to ground-water recharge. See response 25B, paragraph 2.

LETTER 26

H E A R I N G - Colstrip, Montana

June 21, 1979

WATER QUALITY BUREAU
Helena, Montana 59601J. R. Lee
352 No. 5th, Box 23
Forsyth, Montana 59327
Phone: AC 406 356-7574

Gentlemen:

I want to make this joint presentation to the Water Quality Bureau as to its hearing on Western Energy Co.'s request for permits to directly discharge water out of their coal mining areas into East Armells Creek and Cow Creek, and as to the hearing concerning Rosebud County's renewal permit for sewer discharges into East Armells Creek.

I want to protest the issuance of these permits, as such discharge water is detrimental to the flood plain of East Armells Creek.

First may I give my own credentials. I have been an Armells Creek Rancher since 1954, with 5 miles on Armells Creek beginning about 4 miles downstream from and north of Colstrip. I have an agricultural education and taught the Veteran's On-Farm Training class in Forsyth, 1949-1953. I have a BBA in Business Administration from Texas Tech University. I also attended Texas Christian University and Harvard Graduate School of Business.

I was a Navy Supply and Disbursing Officer, World War II. I have been a local bank director for 13 years.

I own irrigated land in the Yellowstone Valley, and a ranch along the Little Porcupine Creek north of the Yellowstone River.

I give these credentials only to let you know why I think I am capable of judging the situation on Armells Creek, and to also show that I am pro-business to the depth of my being, even to my own detriment.

I have never considered myself an environmental activist. I haven't looked for boogers under every bush when it comes to industrial activity. I have not been a part of any harassment of the coal mining interests at Colstrip.

In 1976, there were severe range fires on my ranch. I will always remember and appreciate the Colstrip companies who sent men and machines to fight those fires.

LETTER 26

2

In fact, I have pussy-footed around the damage being done to the Armells Creek flood plain and to the hay base of my ranch, thinking that surely the companies involved, as well as the federal and state regulatory bureaus, would not let this happen, and surely would not let it continue. How wrong I was.

I now must protest this water, and demand that it be stopped and controlled.

First let me give the background to this damage.

Armells Creek has always been an intermittent winding creek causing many small cut-up meadows, running only from snow run-off in the spring and during occasional rainy periods. The balance of the time, the creek bed dried up, so that cattle, trucks, and hay machinery had ready access back and forth across the creek bed. The creek has hardly no channel at all through the lower portions of my hay meadows. This lack of channel is a natural condition and has never been tampered with by myself or others.

Other portions of my meadows have a fair-sized channel without low flood plains. On these portions I had built dams for water flooding as well as access.

Armells Creek above its forks is not a stabilized creek with a gravel strata and gravel bars to carry water. Instead, above the forks all the way to Colstrip it is a mudhole with no natural drainage. The lack of enough water was always a problem, but God help you if you did not use it when it came, and then get rid of it and let the meadows dry up.

Below its forks, Armells Creek stabilizes with a deep channel and gravel bars and gravel strata. So far, ranchers down the creek from its forks are not feeling the damage caused by extra water, but I think they should beware of the highly mineralized water out of the coal mines, should they try to put it on the surface of their hay fields.

My family owns a ranch on the Little Porcupine Creek north of Forsyth; since 1948, hot artesian water from an old oil well has flowed through the creek for 20 miles. This highly mineralized water has completely sterilized a neighbor's

LETTER 26

3

field that he tried to irrigate. Not a spear of grass grew for 6 or 7 years. I do not know the degree of mineralization in the water from the coal mines of Colstrip, but I suspect it to be high. I was told by Montana Power Co. Engineers that the water from artesian wells dug at Colstrip in about 1973 by Western Energy Co. searching for a water supply was too highly mineralized to be used in the power plants, hence the piping of Yellowstone River water to Colstrip for industrial and municipal usage.

As I understood the original plans for Plants 1 and 2, they called for large cooling ponds and the release of hot water into Armells Creek. I wrote a letter to Mr. Jack Corette, who I had met in the past, expressing my concern that releases of water into Armells Creek held a high probability of doing damage to the land below Colstrip. I received nice letters in reply from Mr. Corette and also Mr. O'Connor saying they appreciated my concern, but that I should have no concern since the plans had been changed to the usage of cooling towers and that they were assured by their engineers that there would be absolutely no discharges from Colstrip and all waste water would be strictly controlled. I believe their intentions were good.

When Plants 1 and 2 were about half completed, Western Energy Co. and Montana Power Co. sought a permit to pipe water up from the Yellowstone River for their complex. I did not fight the issuance of this permit, but, rather, testified at the hearing in Forsyth that I thought I could live with five miles of water pipeline across my ranch.

I may have been the first rancher to actually accept their financial offer for the pipeline easement. I thought their offer was fair. In many ways their land men were nicer to me, as well as others, than they had to be, in the building of this pipeline. Their re-seeding of the surface was good.

After the sewer lagoons were built, the State Water Quality Bureau held a hearing to grant a release of treated sewer water into Armells Creek. Only sewer

LETTER 26

L

water was mentioned. Nothing was said about any industrial water. Rancher Janet MacDonald, who owned the ranch between my own and Colstrip, and I appeared in order to protest any release. There was good attendance, but by and large I could not make anyone understand how the making of a live stream out of Armells Creek, which was naturally only an intermittent stream, could be anything but a blessing in a dry land such as this.

Janet and I finally agreed to releases on a trial basis to see how we got along. It is now my understanding that Western Energy has purchased the MacDonald Ranch.

In the meantime I had cut all my dams on the creek and installed 15" pipes to let water move through, trying to forestall damage to my meadows. I did this at my own expense, and felt it was the only thing my resources would allow. I should have, however, bought larger pipes. Yet, by and large, these pipes have protected those parts of the meadows where an adequately deep creek channel is present.

All the cooling ponds, settlement ponds, sewer lagoons, and the large surge pond into which the Montana Power Co.'s pipeline empties began to shove water into the scoria-type soil; and, since they are all above the creek level, the water naturally permeates to the creek bed sooner or later and creates a large flowing stream out of Armells Creek.

Since the surge pond was filled, the only time the creek has quit running was when Western Energy Co. dug a sump pit below the dam of the surge pond and re-pumped the seep water up into the dam pond. They then lowered the pond and pumped amazing amounts of concrete into the slopes of their reservoirs trying to stop the seepage. They were only partially successful. I do not believe their sump pump has been used since that time in 1975.

This steady water kept flowing, minute by minute, hour by hour, day by day, and year by year. This steady flow varies from 200 gallons per minute to

1000 gallons per minute, plus whatever natural run-off comes. It is devastating to the water table in the creek valley. I have seen no evidence of silt or a silting effect on my meadows, just water-logging.

On my ranch I can see no differences or changes on the side creeks or out in the hills, only to the flood plain and sub-irrigated areas along the main creek.

An older couple, the Albert Kozalkas, have a ranch downstream from me with flood dams on the creek and no channel in spots. Their meadows are now a water-logged duck pond, and are virtually useless. He is blind and in his 90's. I am glad he can't see what's happened to his ranch. I understand that Western Energy Co. paid them some small money damages, with the promise of more later. Their small ranch is about a wreck, as anyone can see from the highway north of Colstrip. Although part of their damage was done prior to the steady water from Colstrip, their ranch meadows are an excellent example of the ultimate damage caused by too much water. I personally put up hay on the bulk of their meadows in 1972. Since that time their meadows can no longer be hayed, and are a wasteland.

Then water was hit in the Western Energy Co.'s new coal mines, and this water was pumped into pits and ponds alongside the main channel of Armells Creek. It doesn't stay there long, but seeps into Armells Creek almost immediately. I have ever strongly suspected that at times this coal mine water has been directly pumped into the creek. I say this because the water at my ranch increases or decreases substantially and dramatically in short periods of time, even when there is no natural run-off.

As to a description of my actual damages, during many parts of the year, the main low meadows on my ranch do not have enough channel through them to even carry all the water coming down from Colstrip. It scatters, and runs across the meadows, water-logging the land, and souring it, so that hay machinery cannot operate and

LETTER 26

6

the alfalfa drowns and dies. There's no justification in replanting under such conditions on the bulk of the damaged land.

I had originally thought the quality of the original seep and waste water from Colstrip was pretty good, as most of it was originally Yellowstone River water; but, since the water from the coal mines has been coming down the creek, I have noticed there is a lot of alkali beginning to come to the surface of the ground in my hay meadows. I do not know if this is due to the highly mineralized coal mine water or if it is just a further natural consequence of the water-logging and lack of drainage. Any student of land and water knows that in the history of the world entire civilizations have been lost due to these types of conditions created by man with his irrigation and his failure to provide proper drainage where the soil structure had no natural drainage.

On Armells Creek, for 20 years, my main low meadows produced 2/3 of my hay because there was enough water there to sustain alfalfa as well as grass. The bench-land hay areas, growing just grass, produced the other 1/3 of my hay. But for the last 5 years, during which the big, steady water has come down the creek, and the alfalfa has died out, the total amount of hay produced is drastically less, with the benchland producing about 2/3 of the total amount of hay and the low heavy meadows producing only 1/3, if I can even get onto the muddy meadows, and the 1/3 is mostly foxtail grass which is hardly worth feeding. Even cattails, characteristically present only in swampy conditions, now grow out on the hay fields. Out of desperation, I have continued to put up this poor hay.

My entire production has been cut so badly that I am now purchasing from 150 to 300 tons of hay per winter and hauling it into the ranch at a trucked-in price of about \$65 per ton, or approximately \$10,000 to \$20,000 per year. This must be done in order to maintain a proper number of cattle on the ranch during the winter to balance the summer grass capacity for cattle.

In dry Montana, each year's hay production varies tremendously; but, now I never produce enough hay to carry over any extra hay to try to tide my cattle

LETTER 26

7

operations over the bad drouth years. My ranch has clearly lost year-long cattle carrying capacity. I did not have to bring in over 100 tons of hay, totally, the first 20 years of my ownership of this ranch, prior to my present problems.

This steady, big flow of water has made wintering cattle on the meadows a nightmare, and the management of the whole ranch a problem as well. I pump drinking water for the cattle from wells, and do not like to depend on the creek for the cattle to drink during the winter. Now the cattle wander across the running water and ice and have great difficulties getting back to the feed ground and to the well water. Sometimes they get trapped. In their attempts to drink through the ice, or to cross back and forth to the feed ground, about 5 to 10 head are now drowning each winter, and this used to never happen.

Can you imagine this running water in 20° below to 40° below weather where it freezes, more boils up and runs on top of the ice, then freezes again, repeating the process until crossing and access is next to impossible. When cattle try to cross the ice, some break through and drown.

In the summer it is nearly impossible to get a truck across the creek to the east side of the ranch which is about 1/4 of the total area of the ranch. This lack of access lessens my management capabilities and options. Trees are dying in the valley down to the forks of the creek. I am not trying to say that these trees have an economic value; yet, dead trees are an eyesore. Their dying is surely an indication of what is happening to the valley, caused by high salinity and a higher water table. Just look at them on your way to Forsyth.

I have walked Armells Creek from the Farley Ranch above Colstrip through the complex and town, and have seen the creek gradually increase from a stream the size of a pencil at Farley's to one of 200 gallons per minute flow below the sewer lagoons. Although the natural run-off at Farley's varies greatly from time to time, the increase in flow due to the complex is still plain to see.

The future prospects for this situation are bad. In the case that further discharge permits are allowed, and if Plants 3 and 4 are built requiring more

LETTER 26

8

ponds, and if there are more coal mines and more total people living in Colstrip to produce more sewage, then Armells Creek could turn into a river. I can easily see that direct discharges from the coal mines alone can double the water coming down the creek. Is their discharge request for any amount of water they wish to discharge, at any time they wish to discharge it?

Once the water gets into the creek, ranchers are powerless to do anything. I believe that nothing can be done to help parts of my ranch without stopping the steady water. It must be held up and not allowed to permeate from the ponds to the creek. The discharges must stop and absolutely no more be allowed.

Surely this is not just a rancher's problem. Surely the Companies and Town ought not to be allowed to kiss their problem goodbye by getting the water into the creek. The Companies have the engineers and hydrologists to control this water. They have good people. Make these people do their jobs.

The turnover of personnel in the companies and in the state bureaus is sometimes so fast that I do not know their attitudes toward the problem. Some want to deny it. Some don't want to even ~~see~~ it. Others, when told about it, act surprised, but to my knowledge no one has ever been down to my ranch until this week to look at the problems. Maybe they had ~~ord's~~ not to.

An employee of the State did take water samples. He sympathized with my problems, but never called back. When I called him, he said, all the water samples had been loused up and others would have to be taken. To my knowledge, no others were ever taken.

I have talked until I am blue, but nobody has any comment but, "What else can the companies do to get rid of their water but let it run downhill?"

I ask the Water Quality Bureau to deny any discharge permits, and to force the companies to stop all this running water, because if it is not stopped the flood plain of Armells Creek will surely die.

LETTER 26

9

I think the companies desperately want these permits in order to support their position in what is happening, and to give them a quick approval in spite of the damage their water is causing; but, if you will deny them the permits, I'll bet their men can solve these problems. They will do so, however, only if they have to, and only if you make them do it. To my thinking, if such permits are not denied, and if the water is not stopped, then the inescapable conclusion is that your hearing process and permit system is only a charade.

I recognize the awkwardness and length of this statement, but I have not exaggerated the conditions. If anything, I have understated them. I want to give each of you the background of how these problems and conditions developed.

I totally refuse to go along with anything that will allow the continuation or the increase of this constant water flowing down Armells Creek.

Your system of hearings and permits as well as your investigations is the last resort, to my knowledge, that will force a solution of these problems. Please do it.

Thank you.

Sincerely,



J. R. Lee

LETTER 26



Waste Water flow in East Fork of Arnolds
Creek from the Colstrip Complex, 6 miles
downstream from Colstrip on the G R Lee
Ranch, pictures 5/8/1979, there being no
natural run-
off for a month.



UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

July 12, 1979

Bob Braico
Water Quality Bureau
Montana Department of Health
Helena, Montana 59601

Dear Bob:

I would like to summarize my thoughts relative to our joint investigation of Armellis Creek, specifically, the section through the J.R. Lee Ranch.

It is my opinion that, at the present time, the stream channel is not capable of adequately handling a base flow.

It is, also, apparent that the present flows are having an adverse effect on riparian and adjacent meadow vegetation.

I further feel that we could not provide technical assistance dealing with stream alteration because of potentially detrimental future effects.

I would recommend that Mr. Lee remove the lower dike and replace all stream crossing with bridge type structures.

I would also recommend seeking an alternative to the releasing of additional water into Armellis Creek due to the present cross sectional characteristics of the creek.

If releasing water must be permitted then it should coincide with normal runoff events, especially those during the spring.

Sincerely,



Dennis R. Loreth
District Conservationist

DRL/jl

cc: Dayton Alsaker
J.R. Lee



LETTER 26

J. R. Lee
Box 23
Forsyth, Montana 59327
Phone (406) 356-7574
July 5, 1979

Alan Merson
Regional Administrator, Region VIII
U.S. Environmental Protection Agency
1860 Lincoln Street
Denver, Colorado 80295

Dear Mr. Merson:

This letter is sent pursuant to 30 U.S.C. 1271 (a) (2) (Surface Mining Control Act). I hereby provide notice that conditions and practices exist which have caused, and can reasonably be expected to cause further, significant and imminent environmental harm to land and water resources on my ranch downstream from Colstrip, Montana. The above conditions and practices are being occasioned and conducted by Western Energy Company in their coal mining activity, Montana Power Company in its electric steam generating activity at the Colstrip complex, and also by the County of Rosebud, State of Montana, in its operation of sewer treatment facilities, which discharges water into Armells Creek for the Subdivision of Colstrip, Montana.

Due to the conditions that prevail in the Colstrip area, practices conducted by the above named parties cause water discharges, as well as a substantial degree of water seep, into the East Fork of Armells Creek, changing it from a natural intermittent stream to one that has run, more or less steadily, since the beginning of their operation in 1974.

This steady water in Armells Creek, which is more than the creek channel through my ranch can handle at times, is water-logging, alkalying and souring my hay meadows on the flood plain of the creek. The hay is dying from these conditions.

Enclosed is my testimony before a hearing, conducted in Colstrip, Montana, on June 21, 1979, conducted by the Water Quality Bureau of the Montana Department of Health and Environmental Sciences in their determination whether or not Rosebud County may continue to discharge treated sewer and industrial waste water into Armells Creek, and whether or not Western Energy Company may discharge water out of their coal mines directly into Armells Creek, as well as into Cow Creek and Hay Coulee, both of which flow into the Rosebud Creek.

Alan Merson
 July 5, 1979
 Page two

As the cessation of surface coal mining is impractical, and would not necessarily completely abate the current damage and imminent danger of further significant environmental harm to my, as well as others, land and water resources, I request that the Secretary of the EPA impose affirmative obligations on the operators requiring them to take whatever steps the Secretary deems necessary to abate the damage and danger, pursuant to the authority vested in the Secretary by 30 U.S.C. 1271 (a) (2).

I further request that the Secretary of the EPA oversee, pursuant to 30 U.S.C. 1271 (b), the Montana Water Quality Bureau, and force affirmative abatement of the damage and danger before any water discharge permits be issued, in line with the Federal Water Pollution Control Act, 33 U.S.C. 1151-1175, and any State Program authorized by 30 U.S.C. 1253.

I appreciate your attention to this grave matter.

Sincerely,

J. R. Lee
 J. R. Lee

cc. Benjamin Wake, Administrator, Environmental Sciences Division,
 Montana Department of Health and Environmental Sciences

W. Paul Schmechel, President, the Western Energy Company and
 the Montana Power Company

Chairman, Rosebud County Commissioners

Cecil Andrews, Sec. of Interior

ROSEBUD COUNTY PLANNING BOARD

FORSYTH, MONTANA 59327

PH. 356-7551

July 9, 1979

Mr. Dayton Alsaker
Water Quality Bureau
Department of Health &
Environmental Sciences
Helena, Montana

Dear Sir,

This letter is in regard to your public notice No.-Mt.-79-08 relating to the issuing of permits for the discharge of water from the Colstrip area. (permits No.-Mt.-0023965 and Mt.-0022373).

I am Coordinator for the Rosebud County Planning Board and a resident of the county living on Armells Creek. I was County Extension Agent in Rosebud-Treasure Counties from 1960-1973.

Of special interest are two publications which I have on file, (1) Bulletin 102, June 1977, "Hydrogeological Conditions and Projections related to Mining near Colstrip, Southeastern Montana", (2) "Ground Water of the Fort Union Coal Region of Eastern Montana", Dec. 1978, both Montana Bureau of Mines and Geology publications. Dr. Wayne A. Van Voast is the principal researcher and author.

While both publications state certain facts about what is known, they recognize the many unknowns about hydrological conditions in the study area. The researchers point out that the areas downstream from Colstrip are developing high water table with some being "waterlogged", while upstream from the project is dry, generally.

PLANNING AWARENESS KNOWLEDGE COMMITMENT

It is noted that the primary cations (positive ions) are calcium, magnesium and sodium and the pre-dominant anion (negative ion) is sulfate. An excess of any of these elements creates a soil condition which makes it literally impossible for crop production.

The statement submitted by Mr. J.R. Lee, who ranches on East Fork of Armell's Creek, very clearly relates the many problems confronting a ranch operation when too much poor quality water is permitted to flow.

Until the quality of water being discharged from the Colstrip complex meets the standards of the State and Federal Clean Water Acts, pollution discharge permits should not be issued.

Sincerely,



Eldon E. Rice

EER:ms
cc: Rosebud County Commissioners
Marylou Melville-Planning Board Chairman
Mr. J.R. Lee

LETTER 27



GENERAL OFFICES 40 EAST BROADWAY BUTTE MONTANA 59701 • TELEPHONE 406/723 5421

September 5, 1979

The Director
U. S. Geological Survey
National Center
Mail Stop 108
Reston, Virginia 22092

Dear Reader,

The Montana Power Company has reviewed the draft environmental statement entitled Northern Powder River Basin Coal, Montana and has the following comments:

P. II-31

27A "The worst case air pollution episodes would occur on elevated terrain down wind of the Colstrip generating units in the winter..." A broad statement of that nature must recognize the frequency of occurrence, plume rise from the generating plants, travel line for the plume, and distance to the terrain.

P. II-31

27B "Air pollution tends to disperse less rapidly in southeastern Montana than in any other sector of the state." That statement does not take into account high wind speeds often observed in the area and large degrees of vertical mixing seen during the days. The statement implies that southeastern Montana is worse than the rest of the state in regard to air pollution potential, when in fact, it is better than many of the mountain valleys of western Montana.

P. II-34

27C "Data from the meteorological tower at Colstrip indicate the inversions are very frequent." Because the tower top at Colstrip is about 500 feet above the terrain, its ability to detect inversions is much better than the more common 10-meter tower, giving the illusion of more frequent inversions. Inversions are no more frequent at Colstrip than for similar terrain in eastern Montana.

27A The many variables you cite are well recognized. The sentence is qualified by the phrase "when inversions during the early morning are common and when the wind is from the northwest." Inversions and mixing heights are also discussed.

27B Noted.

27C Comment noted. The frequency of inversions at Colstrip was based on data at hand. Inversions are generally detected with radiosondes, not with 10- or 150-meter towers as at Colstrip. Towers provide a better indication of daily frequency of occurrence of inversions, but only between fixed heights. Much shallower inversions may be detected by towers.

P. II-35

27D

"The air quality of the six-county study area is generally excellent, except for local fugitive dust and gaseous emissions from strip mines and the plume from Colstrip Units 1 and 2." Data from the air quality monitoring stations in the Colstrip area show Colstrip Units 1 and 2 operate well within the federal and state ambient and emission standards.

P. II-36

27E

"The 24-hour maximum.....50 to 243...." The statement implies that no other range is possible. Actually the range merely reflects the data used in compiling the draft.

P. II-37

27F

It should be recognized that the offset agreed to by the State Department of Health and Board of Health in the construction permit proceedings on Colstrip was for an area within a one-mile radius of sampling site MPO3. The state agency and Board were convinced that the offset could be achieved. The State Lands Department gave other testimony at the hearing and this may be the basis of the quoted statement.

P. II-43

27G

NO_x, not SO₂, is the most abundant pollutant from Units 1 and 2.

P. II-43

27H

We question whether David Webber was authorized to speak for EPA as footnoted. A draft report prepared by Battelle Northwest for EPA is under review. The Montana Power Company has submitted a lengthy critique of the report to EPA Region VIII. "Oral communications" as cited here and elsewhere in the draft are of limited value because they lack documentation and are unavailable for peer or public review and comment.

P. II-43

27I

Figure II-23 shows that NO_x emissions from Units 1 and 2 are within NSPS. The words "for the most part" should be stricken. Extensive source testing under state and federal direction has been carried out on Units 1 and 2 showing that NO_x as well as SO₂ and particulate emission rates are being met.

P. II-46

27J

CO₂ emissions are the result of the combustion process. The statement implies that limiting CO emissions during coal combustion is the major cause of CO₂ emissions. Burning carbon in the presence of sufficient oxygen forms carbon dioxide.

27D See responses 35I and 35K. Available data showed that the Colstrip site was in excess of both the 24-hour and annual TSP standards. The designation of the Colstrip nonattainment area by the EPA was based on TSP records through 1977. Air quality problems can exist at levels within standards.

27E The fourth sentence of paragraph 1 is revised to read, "The maximum concentration in rural areas ranged from 50 to 243 ug/m³ in 1977."

27F Noted.

27G Error noted. The first sentence on page II-42 is deleted.

27H Correction made. We have used oral communications, despite their limitations, in order to provide the decisionmaker and the public with current information that has not yet been published.

27I Delete "for the most part." The emphasis should be on "proper plant operation."

27J Delete "However, this creates considerable CO₂ emission."

- P. II-48
In the absence of citations of scientific data, we object to the large number of conjectures on this page as to "what may happen."
- 27K The data base for determining whether the rain in the Colstrip area is acid or not should be examined as to method, number of samples, and time of year before any conclusion is drawn.
- 27L The question of floride in honeybees has not been satisfactorily answered based on limited sampling periods and possibilities of floride naturally available in water accessible to some colonies of bees.
- P. III-75
27M "The east fork (Arnell's Creek) also has a minor fishery." This may be true for the portion of the stream below mining areas C and D. Above areas C and D, however, the stream is dry most of the year and supports no fishery.
- P. III-8
27N The federal ozone standard is 0.12 or 235 not 0.08ppm or 160 as stated.
- P. IV-3
27O The allegation of Colstrip 3 and 4 degrading vegetation in the vicinity of the power plants is not contained in the findings of fact and conclusions of law on the Colstrip 3 and 4 Certificate of Environmental Compatibility and Public Need.
- P. IV-II
27P Again, statements about acid rain are nothing more than conjecture.
- P. IV-16
27Q Colstrip Units 1 and 2 as well as Units 3 and 4 are not subject to the revised new New Source Performance Standards (May 25, 1979). Comparisons to those standards are not appropriate.
- P. IV-18
27R Models used by Williams have not undergone the required critique and have not been accepted by EPA. Only EPA-approved models should have been used for any projections made regarding Colstrip or any other mining area. Modeling for TSP from low-level sources (which includes coal mining) is still in research and development stages.
- P. IV-36
27S The Air Quality Impacts on Vegetation section states that injury to ponderosa pine needles from sulfur dioxide

- 27K Projections in this EIS have been made according to our best professional judgement based on available data and experience. Acid rain has been recorded in some regions where coal is burned for industry or power generation, and it might be produced in southeastern Montana under the projected level of coal development. Rain is normally acidic. Data suggest that rain near Colstrip has a mean pH of 5.2 (acidic; neutral is 7.0).
- 27L Your comment is noted. References for fluoride increases have been cited.
- 27M Your comment is correct. See also response 35S.
- 27N Thank you for calling attention to this mistake.
- 27O The possibility of vegetative impact from emissions from fossil-fueled powerplants exists.
- 27P See response 27K. The 1978 data indicate that acid rain is present in the area.
- 27Q Your comment that the New Source Performance Standards do not apply to units 1-4 is correct; however, the standards provide a benchmark for the evaluation of air quality impacts even though they do not apply for enforcement purposes.
- 27R The models used by Williams are Gaussian diffusion models similar to those developed by EPA. The models can be used to predict impacts even though they have not been accepted by EPA. We believe that any of these models tend to underestimate potential fine particulate problems. We agree that modeling for TSP from low-level sources is not well understood.
- 27S Noted. This again describes a subject that is not well understood.

and nitrogen oxides has occurred within a 4-mile radius of the plant. The Air Quality section of Chapter II, which is referenced, does not address injury to ponderosa pine from nitrogen oxides. The sulfur dioxide discussion in Chapter II states that Gordon and others (1979) have documented subtle injury to conifers on the buttes 3 miles north and south of Colstrip. The EPA's Third Interim Report (Gordon and others) discusses sulfur level in pine needles collected in 1975 (preoperational) and 1976 (postoperation). The report indicates no significant differences in sulfur parameters in ponderosa pine from 1975 through 1976. The Fourth Interim Report states that sulfur analyses from 1977 samples are not yet complete and have not been subjected to statistical interpretation. Results of studies by Munshower (1979) show "Neither elemental analyses nor plant immunity studies have shown any adverse response to pollutant emissions from Colstrip Units I and II."¹

P. VII-1

27T

We object to the statement, "The proposed generating units would contribute significantly to maintaining the Colstrip vicinity as a nonattainment area for air quality..." This general statement is contrary to the opinion contained in the Board of Health and Environmental Sciences construction permit for Colstrip Units 3 and 4.

27T Change "would" to "may." Delete "significantly." Significant air quality degradation, if present, would be temporary, assuming successful control.

P. VIII-15

27U

The statement "Montana Power Company's 330-MW generating unit 5 would be built at Colstrip and come on-line in 1988,..." is misleading. The site for that unit has not been chosen yet. Conjecture as to its location would be premature.

27U Noted. Our projections were based on indications of industry interest and are intended to be representative of what could reasonably be expected to happen.

The Montana Power Company appreciates the opportunity to comment on the draft environmental statement.

Sincerely,



D. M. Sprague
Manager Environmental Dept.
The Montana Power Company

DMS/jd

¹ Munshower, F.F., D.K. Neuman, E.J. DePuit. 1979. The Effects of Power plant Emissions on the Range Resource in the Vicinity of Colstrip, Montana. Progress Report, 1979. Prepared for the Environmental Protection Dept., Montana Power Company p. 77.



montco

P. O. Box 31572 • Billings, Montana 59107 • 406-252-5208
22-N-002
21-N-001

September 5, 1979

Director
U.S. Geological Survey
108 National Center
Reston VA 22092

SUBJECT: Comments on the Draft Environmental Statement;
Northern Powder River Basin Coal, Montana

Dear Sir:

Montco appreciates the opportunity to submit the following comments on the subject Draft Environmental Impact Statement.

Chapter VIII of the Draft Environmental Statement (DES) contains a non site-specific analysis of Montco's mine project. The proposed Montco mine is located near the Tongue River between Ashland and Birney, Montana, and is referred to as the Nance minesite and is accurately described in FIGURE VIII-1.

Montco is now conducting intensive baseline environmental, geological and engineering studies within and concerning the project area. Its purpose is to obtain sufficient information, data and understanding to produce mining and reclamation plans and a mine permit application which will meet the requirements of State and Federal laws and regulations. It also hopes that facts now being collected can be used for a site-specific environmental impact statement (EIS) to be prepared by the Department of State Lands (DSL) in response to its application for a mining permit and by other State and Federal agencies in connection with other aspects of the project.

Director
U.S. Geological Survey
September 5, 1979
Page 2



28A Because Montco's data collection activities are incomplete and because it has yet to develop final mining and reclamation plans, Montco is not able to respond to a number of the supposed impacts specifically described in Chapter VIII, such as: the impact on geology and hydrology suggested at page VIII-5; the impact on soils, vegetation and wildlife suggested at page VIII-9; the impact on Ashland described at page VIII-10; the impact on the Northern Cheyenne Tribe described at page VIII-13; and the impact on cultural resources suggested at page VIII-14. Of course, all of these concerns, as well as plans for mitigation of their impact, will be specifically addressed in Montco's application for a mining permit and the DSL's site-specific EIS. It should be noted that the descriptions of impacts contained in Chapter VIII do not acknowledge that Montco will be required to operate under a comprehensive array of State and Federal laws and regulations governing mining and reclamation and preservation of physical, biological, historic and cultural resources in and surrounding the project area.

28B Several sections of the DES require more specific comment. Page VIII-4 contains the statement that "Rosebud County would experience a fiscal time lag due to the Nance mine". A similar statement is found in the last two sentences of the first paragraph of page VIII-13. These statements fail to recognize the large amount of State and Federal pre-impact funding now available to local governments. They also fail to recognize the high degree of sophistication now employed by local, State and Federal agencies in pre-impact planning and development of public facilities. Intelligent application of these funds should relieve the "fiscal time lag" previously experienced by growing communities.

28C Similarly, the DES fails to satisfactorily acknowledge public revenues which will result from the coal severance tax, gross proceeds taxes, royalty on State coal and royalty on Federal coal (which is shared with the State of Montana). For example, neither TABLE IV-13 nor the narrative at pages VIII-11 through 13 make reference to these very significant sources of revenue. The DES does not point out that several of these sources have already generated large accounts (from existing mining operations) which are now available for pre-impact planning and capital expenditure by local governments.

28D According to Montco's current plans, mine construction in the project area will not commence until 1982 and mining will not

28A *note a.*

28B Local governments rarely receive impact funding in advance of coal development. The Montana Coal Board has made relatively minor planning grants and has funded the expansion of Ashland's water system: in the latter case, the expected impacts have not yet materialized. It does not appear likely that pre-impact assistance from the State of Montana will normally be available in the future. The existing Federal programs are not well funded and concentrate their attention on previously impacted areas in an attempt to catch up. Unless outside funding becomes available to the impacted school districts and town(s), the fiscal timelag could well be serious.

28C The severance tax estimates are included in the totals reported in table IV-13; the words "severance tax" should be added to the table's heading. The severance tax would make up 70 to 85 percent of the total State revenues received from the Montana counties. Only a fraction of the severance tax is available for impact assistance. (See table 11-27.) The large accounts to which the comment refers are in a trust fund and would not be available for pre-impact planning and capital expenditures without a specific authorization by the Montana Legislature.

28D The correction is noted. This EIS is based on industry projections which were current in mid-1978. Because of changing conditions, the projections are no longer current in every detail; however, the overall level of development evaluated in chapter IV still is representative of the kinds of impacts that would occur.

Director
U.S. Geological Survey
September 5, 1979
Page 3



begin before the middle of 1984. The first sentence of page VIII-13 should be changed accordingly.

28E In discussion of air quality impacts from area sources (pages VIII-6 and VIII-18), the DES assumes that Montco mine employees would live in Colstrip and, thereby, be the cause of the majority of the increase in population-related air pollution. However, discussions regarding the social environment (pages VIII-10, VIII-22, and VIII-23), as well as discussion concerning the Indian employment (pages VIII-13 and VIII-26) and community services (pages VIII-13 and VIII-26) indicate Ashland would experience the majority of the population increase from the Montco mine. The DES must discuss the assumed distribution of the Montco mine employees among Colstrip, Ashland, Broadus and any other communities if the air quality as well as social environment and community services impacts are to be adequately assessed.

28F The discussion on page VIII-13 states "On the basis of past experience, it is assumed that 17 members of the Northern Cheyenne Tribe might get mining jobs at the Nance mine". No reference is given as to what the "past experience" has been. Due to the proximity of the Montco mine to the Northern Cheyenne Indian Reservation, the number of Tribal members which "might get mining jobs" could be significantly greater than "17". If more than 17 did get jobs at the Montco mine, this would significantly reduce the estimated population increase due to immigration. The discussion of Indian employment does not adequately consider the possibility of significant Indian employment at the Montco mine.

28G The discussion of TSP concentrations (pages VIII-7) as a result of emissions from the Montco mine incorrectly confuses TSP concentrations above baseline and PSD increments. The discussion on pages III-9 and III-10 make the clear and correct distinction between fugitive and non-fugitive dust. As indicated on pages III-9 and III-10, only non-fugitive dust is considered against PSD increments. The discussion on VIII-7 incorrectly assumes that fugitive dust is considered against the PSD increments. If the fugitive dust contribution is removed from the TSP levels calculated for the annual geometric mean and the second-highest 24-hour maximum the Class I air quality increments would not be exceeded.

28E Employee settlement patterns were based on existing locations of mine employees. In the low level of production, we assumed that 10 percent of the Nance mine employees would locate in rural areas near the minesite, with the remainder split equally between Sheridan and the Ashland-Colstrip area. Broadus is too small and too far away to draw many employees.

The Nance employees living in Colstrip would be a minority of the town's population but would cause most of the projected population increase there.

Under the high level of production, three other mines in addition to Nance would open near Ashland, accounting for many of the new workers in the Colstrip area.

28F The past experience referred to in volume 1 was the construction of Colstrip units 1 and 2 as reported by the Northern Cheyenne Tribe (1976). In the absence of a specific proposal by the company to provide for a larger participation by the Northern Cheyenne, it did not seem reasonable to project a higher participation rate. See related comments 10F, 10I, 20P and 20R. If a greater number of Northern Cheyenne were employed by the mine, fewer immigrants could be expected.

28G Even if fugitive dust were removed from the calculation of air quality levels, its contribution to the degradation of air quality still would exist. The issue may soon be moot due to a court decision exempting surface coal mines from PSD review. (See comment 36B.)

Director
U.S. Geological Survey
September 5, 1979
Page 4



28H Irrespective of whether or not fugitive dust were removed from the calculated concentrations, Montco questions the adequacy of the input meteorological data and emission data used in the modeling. Montco is currently collecting the meteorological data needed to adequately model the air quality effects of the Montco mine. In like manner, Montco has not finalized the mine design to the point to where it could compile sufficiently accurate emissions rates to adequately model the mine.

28I The discussion of TSP should accurately reflect the regulatory definition of PSD increment consumption as well as employ site-specific meteorological data and accurate emission data. The discussion on page VIII-7 is faulty in all three regards and must be corrected or deleted.

28J The discussion of PSD on page III-10 states that "the addition of any new sources of air pollution in an area . . . must be offset by reductions in pollution from other sources in the same area". This should be corrected because "offsets" apply only in non-attainment areas and do not apply in areas where air quality is equal to or better than ambient air quality standards.

28K The discussion of wildlife impacts on page VIII-9 lumps together the Montco mine and a railroad from Colstrip to the Montco mine. This lumping together of the two projects makes it difficult to separate the impacts of each project.

28L Reference is made to "high-priority wildlife habitat" without any definition and/or location of such habitat. It is unclear as to whether the reference of 5000 acres is the total disturbed by both the railroad and the mine or whether the 5000 acres impacted includes areas not actually disturbed.

28M The conclusion is made (page VIII-9) that the mine area will be converted from native grassland to domestic vegetation. As is noted elsewhere in the DES, Montco has not submitted a mining and reclamation plan. Therefore, this conclusion is not based on any information supplied by Montco and does not reflect the plans of Montco.

28H Noted. The air quality modeling was based on preliminary data.

28I See response 5b.

28J The comment regarding offset is correct--the discussion of PSD on page III-10 applies only to the Colstrip nonattainment area, which does not include the Montco minesite.

28K The EIS is a cumulative analysis and is not intended to cover the Montco mine in site-specific detail; thus, the impacts of the mine and the associated railroad are considered together.

28L About half of the 5,000 acres would be physically disturbed by the mine and the railroad; the rest would be in rights-of-way and areas adjacent to the mine where some disturbance of wildlife would occur.

The area is high-priority habitat because it includes major antelope winter concentration areas and habitat considered crucial for grouse species.

28M Our conclusions were based on experience with operating mines in the region; we recognize that Montco may submit different reclamation plans.

LETTER 28

Director
U.S. Geological Survey
September 5, 1979
Page 5



We hope that our comments are helpful and will be of assistance
in the preparation of the Final EIS.

Sincerely yours,

MONTCO


Bruce L. Ennis

BLE:lmd

LETTER 29

NORTHERN ENERGY
RESOURCES COMPANY
529 SW THIRD AVENUE
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TELEPHONE 503-243-4435



September 6, 1979

Director
U.S. Geological Survey
108 National Center
Reston, VA 22092

Dear Sir:

Enclosed are three copies of the written comments of NERCO, Inc., prepared in connection with the Draft Environmental Statement, Regional Analysis, for Northern Powder River Basin Coal, Montana.

Yours sincerely,

A handwritten signature in dark ink, appearing to read 'W. W. Lyons'. The signature is written in a cursive, flowing style.

WWL/pdo
Enclosures

WILLIAM W. LYONS, VICE PRESIDENT

LETTER 29

COMMENTS OF NERCO, INC., ON VOLUME ONE OF NORTHERN POWDER RIVER BASIN COAL DRAFT ENVIRONMENTAL STATEMENT, REGIONAL ANALYSIS, PREPARED BY UNITED STATES GEOLOGICAL SURVEY, DEPARTMENT OF THE INTERIOR, AND MONTANA DEPARTMENT OF STATE LANDS

NERCO, Inc., herewith submits its written Comments on Volume One of the Draft Environmental Statement, Regional Analysis, for Northern Powder River Basin Coal, Montana. NERCO is the parent corporation of Spring Creek Coal Company, owner and operator of the Spring Creek Mine near Decker, Montana.

GENERAL COMMENTS

29A

As discussed in oral comments delivered at the public hearing on the Northern Powder River Basin Coal Draft Environmental Statement held in Sheridan, Wyoming, August 23, 1979, the Spring Creek Mine should not be treated as a "proposed mine" in this environmental statement.

Volume One of the Northern Powder River Basin Draft Environmental Statement, in its own words,

"... is an analysis of environmental impacts from current coal development proposals on existing leases in the Northern Powder River Basin of Montana. Three mining and reclamation plans ("mine plans") have been proposed for federal and state approval; two electric power-generating units have been proposed for federal approval." (DES, page iii).

NERCO's Spring Creek Mine is viewed as one of the three new proposed surface mines, although the drafters of the Draft Environmental Statement acknowledge that a complete Final Environmental Statement was completed on the Spring Creek Mine in February 1979, that the mine plan was approved by the State of Montana and the Secretary of the Interior, and that the permits needed to proceed with development were issued in April 1979. (DES, page I-6). An analysis of regional impacts contained in the Spring Creek Mine Final Environmental Statement was considered thoroughly as part of that permit review process. Thus, in NERCO's view, Spring Creek cannot be considered a "proposed mine" as has been done in this Draft Environmental Statement. Spring Creek is an existing mine, the Secretary of the Interior and the State of Montana having issued the permits necessary for development of the mine.

As noted in the New Programmatic Environmental Statement on the Federal Coal Management Program (April 1979), the regional environmental statements, of which this is one, are broad overviews of the impact of coal development activities and can be accompanied by additional stand-alone site specific analyses of mine plans (Coal Management Program FES, page 1.1.4). In this case, the site specific impacts of the Spring Creek Mine Plan have already been analyzed and the requirements of the National Environmental Policy Act have already been met. This procedure is fully responsive to the decision of the United States Supreme Court in Kleppe v. Sierra Club

29A The Spring Creek mine has been approved as noted. When the regional analysis was begun, Spring Creek was still a proposed mine, and it would have been premature to consider it as approved.

By the time volume I was issued, however, the mine had been approved. Projected coal production and employment levels at the Spring Creek mine were used in the analysis. The fact that the Spring Creek mine has been approved does not materially change the results of the regional analysis. (See chapter IX, Clarification of Scope and Purpose.)

Much of the analysis in this regional statement is incorporated in FES 79-10 on the Spring Creek mine. The framework for the analysis is somewhat different, however. For example, FES 79-10 does not assume construction of a new town in southern Big Horn County as is assumed in this statement. FES 79-10 therefore serves as a worst-case analysis of social and economic impacts on Sheridan County, Wyoming, because the new town assumed in the regional statement would mitigate those impacts.

-2-

which holds that an agency can approve a project that is fully covered by an Environmental Impact Statement and then take the environmental effects of that existing project into consideration when preparing a broad overview statement like Volume One of the Northern Powder River Basin Coal Environmental Statement.

Since the Spring Creek Mine Plan has already been thoroughly analyzed in an environmental statement and approved, Spring Creek should not be treated as a "proposed" mine in this environmental statement. This is particularly important in preventing confusion as the public and the affected state and federal agencies assess the alternatives presented in the Draft Environmental Statement.

Despite the fact that the Spring Creek Mine is an existing mine and should be considered a part of the existing environment for the purposes of the Northern Powder River Regional Environmental Statement, several specific references are made to impacts resulting from the Spring Creek development as though a federal decision is pending on that project. Though such a decision is not pending (and in fact was made upon completion of the Spring Creek Site Specific Environmental Statement), certain of those references demand further comment. In each case, our comments follow a direct quotation or other reference from the Draft Environmental Statement.

SOILS

"Due to the drastic alteration of soils, reclaimed areas would require specialized management until well after bond release." (Page IV-27)

29B

Comments. The conclusions that there would be a "drastic alteration of soils" and that "reclaimed areas would require specialized management until well after bond release" are not adequately supported by the text.

Although the post-bond-release "specialized management" which would be required is not specifically defined, increased range management is alluded to in a generalized discussion of the potential influences of over grazing on reclaimed land. The foundation of the discussion is a misleading statement loosely relating supposed soil structure and organic matter losses to grazing considerations (Section D, page IV-32, paragraph 2, line 5). It is implied, although again never clearly stated, that the nature of the alleged "drastic alteration of soils" is related to the soil structural and organic matter losses as a consequence of proposed mining operations. With respect to conditions at the Spring Creek mine site, this conjecture is not valid.

As a result of the physical manipulation of soils during topsoil recovery operations, some limited structural alteration of the soils can be expected, especially in surface materials. There exists no evidence, however, to suggest that the resultant degree of structural change would be, in any sense, universally "drastic."

As discussed under the description of the existing environment (Page II-55), 65 percent of the soils in the region are Entisols,

29B These comments are similar to those in FES 79-10.

There is a large and growing body of scientific literature dealing with the problems caused by soil disturbance through mining. An example is the 742-page Reclamation of Drastically Disturbed Lands (Schaller and Sutton, 1978) in which the issues discussed in the DES are probed in depth. The existing body of knowledge indicates that the reclamation of mined lands will be a long-term concern.

LETTER 29

-3-

specifically Torriorthents, also with minimal profile development and lacking well defined structure. It is illogical to expect a "drastic" alteration of soil structure in material lacking structure to begin with. Further, the remaining significant soils on the Spring Creek site are Camborthids showing again minimal profile development and leaving very little room for "drastic" structural changes as a result of mining operations.

The predicted reduction of organic matter cannot necessarily be expected following topsoil removal and most notably not if topsoil is stored for any appreciable length of time. In fact, the reverse may well be true. The addition of native vegetation to the soils during the topsoil stripping operation may well serve to accelerate the decomposition of plant materials, by virtue of increased carbon-energy substrate to fuel microbial transformations. This process can be expected to continue during topsoil storage until such time as nitrogen becomes limiting and resultant C/N ratios inhibitory. Regardless, it is well known that the organic matter content of arid and semi-arid soils rarely exceeds 2% and is generally concentrated in the upper 20 centimeters of the soil. As such, the contribution of organic matter to soil structure, for the soils in question, can be considered as minimal. Assuming even a significant loss of organic matter prior to revegetation, a number of reclamation technologies, most notably mulching, are available to quickly and effectively add readily decomposable organic materials to the soil surface. Follow-up additions of fertilizer nitrogen would be an added assurance that organic matter would be subsequently incorporated into the replaced topsoil.

"Reclaimed soils at the Spring Creek mine (as originally proposed) would allow successful establishment of vegetation, but would develop problems with growth and succession later, probably before bond release." (Page IV-28).

29C

Comments. The "problems" alluded to in this conclusory statement are apparently related to the sodic condition of overburden materials at the Spring Creek Mine. The conclusion that the sodic condition of this overburden will present a problem is based upon the supposition that Sodium-Adsorption-Ratio (SAR) is a reliable index for describing sodicity in all overburden materials, a supposition which may well be in error. Further, the unqualified statement that sodium would move upward into the topsoil (within three to ten years without specified mitigation measures) is overly speculative and, moreover, unnecessary given the fact that mitigatory measures have been required for the Spring Creek Mine. In fact, the necessity of the entire argument is questionable in that the authors have unqualifiedly stated that the revised reclamation plan has corrected the problem altogether. What is not stated in the Draft Environmental Statement is that the required corrective measures may be unduly harsh in that Spring Creek Coal Company will be required to bury any materials with SAR value greater than 12 under 8 feet of "suitable" materials.

In the Draft Environmental Statement, it is noted that conditions at the Spring Creek Mine differ only slightly from those of cited

29C Spring Creek Coal Company's mining permit requires burial of sodic material. The discussion of problems arising from sodic overburden in volume 1 therefore no longer applies. The text relating to sodic overburden is deleted.

-4-

experimental sites where the upward movement of sodium was pronounced. A discussion of those conditions and controlling influences, however, is conspicuously absent. The argument could be presented with greater confidence in relation to the neighboring Decker mine site, where equally similar conditions occur, but with unmanifested sodic problems.

The reliability of the Sodium-Adsorption-Ratio ("SAR") as an index of the sodic hazard in all overburden materials is questionable (Berg 1978). The index better suited as a predictor of the influence of sodium on soil physical properties, i.e., the Exchangeable Sodium Percentage ("ESP"), is not universally well correlated with SAR in overburden (Farmer & Richardson 1976). In fact, if this correlation is presumed, an ESP value derived from the SAR value may overstate actual conditions by a factor of two or more in some overburden materials (Olsen 1979).

It is the contention of Spring Creek Coal Company that ESP is a more suitable criterion for evaluating sodicity in overburden than is SAR. The use of ESP data as the sole index of sodic conditions at the Spring Creek site considerably reduces the volume of overburden suspected to pose a potential sodic hazard.

It is noted that overburden in the eastern half of the Spring Creek Mine has an average SAR of 29.6 and has therefore been determined by the Montana Department of State Lands to be unacceptable material. If removed, this overburden material will be buried under at least 8 feet of suitable materials, removing any reasonable concerns about the upward migration of sodium into replaced topsoil.

" . . . Compaction during grading and/or sodic overburden spoils could develop an impermeable interface between 'topsoil' and spoils, severely restricting soil water-percolation and rooting depth (Gary Wendt, oral commun.; Gilley and others, 1976). This effect would be most pronounced at the Spring Creek and Pearl Mines where the impermeable interface would be within 20 inches of the surface." (Page IV-31).

Comments. The statement refers to the development of impermeable interface between topsoil and spoils as a result of compaction and/or the presence of sodic overburden. The fact that sodic materials at Spring Creek will be buried 8 feet below the surface makes the development of an impermeable interface within 20 inches of the surface a physical impossibility.

Due to the operation of heavy equipment on replaced soils some compaction will result. The compaction would not however, be severe, nor long lived. Mulching and deep-ripping, followed by root penetration and development would result in the "breakup of any such shallow compacted layers".

VEGETATION

29E Two major vegetation topics are discussed in the Draft Environmental Statement ("DES"): (1) it is assumed that vegetation productivity on reclaimed lands will be significantly reduced from premining levels, and

29D See response 29C.

29E Vegetation productivity would not necessarily be significantly reduced from premining levels. See discussion beginning on page IV-33.

LETTER 29

-5-

(2) it is assumed that wildlife and livestock utilization will be significantly reduced on reclaimed lands as a result of decreased vegetative diversity and productivity. Neither data nor a precise rationale are presented to justify most of the statements presented in the DES and rebuttal, therefore, it is difficult in some cases.

29F One major concern expressed in the DES is that at some time in the future, either before or after bond release or after the life of the mine, vegetation on reclaimed lands will fail. The reasons given for this failure, or significantly reduced productivity and diversity, are: (1) poor soils, (2) poor seed species choice, (3) poor seeding or establishment techniques, (4) drought, and (5) poor management techniques. Much of the argument becomes a matter of faith in technology and management techniques. Spring Creek Coal Company will, as stated in the mine permit stipulations, handle poor soils properly and use current vegetation establishment and management techniques. Spring Creek Coal Company has selected native vegetation species which will survive natural environmental fluctuations and drought. Arguments set forth in the DES are contradictory, in that literature is discussed (page IV-35) which indicates that if proper reclamation and management practices are utilized, heterogeneous vegetation patterns and a natural return of premining levels of productivity will appear. It is also stated that, "by the time a given mine would be abandoned, successional patterns and trends would probably be recognizable in the earlier reclaimed areas" (page IV-35). Therefore, statements to the effect that Spring Creek Coal Company will be unable to achieve successful reclamation are unfounded.

29G The second major concern regarding wildlife and livestock utilization is also based on a great deal of speculation. Plant species have been selected for both wildlife and livestock utilization. Successful reclamation is based upon whether Spring Creek Coal Company achieves adequate stands of these species. Post mining plant productivity, cover, and diversity must meet state and federal regulations. Spring Creek Coal Company is obligated to meet these standards and as a consequence, wildlife and livestock utilization potential will be at or above the premining levels. More specific comments follow:

"Most of the soils which may ultimately be mined were formed under shrub grassland vegetation and are calcareous and relatively low in organic matter. Locally, where ponderosa pine dominates the plant communities at higher elevations, soils are slightly acid and comparatively high in organic matter." (Page II-55).

29H Comments. Soils which are formed under sage grassland vegetation are higher in organic matter than are soils formed under ponderosa pine vegetation.

"The distribution of vegetation is controlled mostly by the scarcity of precipitation, to some extent by soils, aspect, and land use, and to a minor extent by elevation." (Page II-63).

29I Comments. Soils, aspect and land use contribute a very significant amount to the vegetation found at any given site.

"The general appearance of this type (Big Sagebrush-Grass) is very similar to the native grass types, however, buffalograss is a prevalent species". (Page II-67).

29F Nowhere is it stated that reclamation at any of the mines in the region will fail. There is, however, the possibility that failure could occur in spots within a mine area, or, less likely, on an entire minesite.

29G Successful reclamation, although required by law, is by no means assured. Mine reclamation in the northern Powder River basin has not been in effect long enough to be judged successful or unsuccessful. Potential productivity after mining could be at or above premining potential, but this has not yet been demonstrated. See response 24D.

29H The comment is correct for grassland and forest soils at the elevation of the minesites; however, the forest soils referred to are most commonly at higher elevations in the Custer National Forest. At those elevations, soils formed under ponderosa pine are higher in organic matter than soils formed under grassland vegetation, due to relatively faster accumulation of litter and slower decomposition.

29I Change the last sentence of paragraph I under chapter II, Vegetation (page II-63) to read:

"The distribution of vegetation is controlled by a number of equally important and interrelated factors, including precipitation, soils, aspect, land use, and elevation."

29J

Comments. Buffalograss does not occur on the Spring Creek Mine site.

29J Noted.

"Rapid growth to cool-season (spring) plants reduces soil water available to warm-season (summer) plants, reducing diversity and long-term reclamation success. Soil water is almost completely depleted each year, forcing the vegetation to rely on spring precipitation to recharge the soil every year. Drought resistance is reduced." (Page IV-31).

29K

Comments. At the Spring Creek Mine, cool-season species clearly dominate with *Agropyron smithii*, *Agropyron spicatum*, *Poa sandbergii*, and *Stipa occidentalis* occurring in all major community types. These native species are well adapted to naturally occurring environmental fluctuations and drought conditions.

29K The statement on page IV-31 refers to conditions recorded on reclaimed lands in the region; the comment refers to native range at the undisturbed minesite. The two are not comparable, owing to greater species diversity and a greater proportion of warm season grasses on native range. Thus, the comment does not contradict the statement on page IV-31.

"At the time of mine abandonment, there would probably be adequate vegetative communities on the mine sites, but in the long term, there is no assurance that the vegetation that ultimately evolved would support anticipated uses for wildlife and livestock grazing." (Page IV-33).

29L

Comments. Under applicable laws and regulations, reclamation and revegetation must proceed as coal removal is completed. At the time of mine abandonment, some areas will have been reclaimed for approximately 30 years. If these reclaimed areas have sustained successful vegetation communities for this period of time, the probability of maintaining this success is very high. Disturbed areas when managed properly return to native climax vegetation.

29L The comment is generally correct, in that any reclaimed area that has supported successful vegetation for 30 years will have a higher probability of continued success than an area only beginning reclamation. A reclaimed area that is managed carefully for 30 years under generally favorable climatic conditions could still fail when subjected to normally high livestock grazing pressure or to periods of drought. Management studies have not been conducted long enough to indicate whether disturbed rangelands will return to native climax vegetation.

"The most serious impact on vegetation on areas disturbed by mining would be the long-term elimination of the natural vegetation mosaic and species diversity on an estimated 23,000 acres, of which about 3,000 acres would be on the three proposed mines. This loss would greatly reduce the capability of these disturbed areas to provide suitable wildlife habitat and watershed protection." (Page IV-33).

29M

Comments. Species to be used in reclamation at the Spring Creek Mine have been selected with wildlife and livestock utilization considerations taken into account.

29M The types of species to be used at Spring Creek were taken into account in the impact analysis.

WILDLIFE

Specific comments on wildlife concerns are as follows:

"Mule deer do not appear to migrate in southeast Montana." (Page II-69).

29N

Comments. Numerous studies in the "Decker subregion" document or indicate mule deer migration. Biggins 1976, 1977, 1978, and VTN, Inc. 1978, all show significant migratory mule deer behavior on and around the Spring Creek study area.

29N True, but their movement is generally confined to local areas.

The following figures refer to locations in Townships 7 North, 8 North and 9 North:

Figure II-34 (Page II-72)
 Figure II-35 (Page II-73)
 Figure II-36 (Page II-74)

290 Comments. These figures should be corrected to refer to Townships 7 South, 8 South and 9 South.

Figure II-36 (Page II-74) shows raptor and game bird use areas in the Decker subregion.

29P Comments. At least four active golden eagle nests, two sage grouse leks, and one sharp-tailed grouse lek in the Prairie Dog Creek area have not been included on this figure. Situated away from presently proposed mining activities, these sites represent portions of the subregional populations which will remain undisturbed by currently proposed mining activities.

"Impacts on wildlife would range from negligible to severe. Some wildlife species would be severely affected for at least the life of the mines and probably several decades after mining." (Page IV-38).

29Q Comments. The severity of mining impacts to any particular wildlife population, or individual, depends on the interaction of a great many factors, both intrinsic and acting externally to each animal. The greatest potential for "severe" impacts probably lies with individual animals of non-mobile species which presently reside within areas proposed for disturbance. These species, such as mice and lizards, generally utilize home ranges of magnitude smaller than surface disturbance generated during a single day of construction. Many of these individuals will be destroyed by the mining process. The larger and more mobile species (deer, pronghorn, and virtually all birds) utilize much larger home ranges with regular daily movements over an area many times greater than construction activities would normally encompass during a single day. As construction activities encroach further into home ranges of these species, the animals will be displaced to surrounding areas. Spring Creek Coal Company will increase the carrying capacity of areas adjacent to mining activities through mitigation efforts. These mitigation/enhancement efforts will help to offset the loss of habitat due to mining and construction activities. Coincident carrying capacity increases in peripheral areas for the less mobile species would result in greater densities of these species, offsetting losses on construction areas. Because of the expanse of similar habitats within the Decker subregion it is highly unlikely that mining disturbances of four to five square mile areas over 25 year time spans will result in severe disturbances to subregional wildlife populations.

"The uses of wildlife for hunting and viewing within the Colstrip and Decker subregions would be substantially lowered for decades." (Page IV-38).

Comments. With enhancement activities on and around mining properties, wildlife communities in these areas will show increased densities and in some cases greater diversities than existed prior to mining activities. As the wildlife becomes accustomed to the

290 Noted.

29P Noted. The habitats identified and considered in this analysis are still important, however.

29Q Spring Creek Coal Company is required under its mining permit to develop a plan for enhancing wildlife habitat in adjacent areas not disturbed by mining; however, there is no assurance that the plan would successfully mitigate all expected impacts on wildlife.

29R,S,U The discussion of impacts in Chapter IV, Wildlife focuses on the Spring Creek mine because, at the time of writing, it was not yet approved. The areas of most severe impact on wildlife are cited in volume 1. Detailed studies of the projected minesites near Decker may well discover additional important wildlife habitats, which would change the perspective of the Spring Creek mine that is presented in volume 1, as well as in FES 79-10.

Areas where antelope and mule deer concentrated during the severe period of the 1977-78 winter are crucial to those species regardless of use near the minesite at other times of the year. The concentration areas are documented by the U. S. Fish and Wildlife Service. Winter range use varies from year to year, but regionwide, habitats are likely at or near carrying capacity. Disturbance of the crucial parts of winter ranges in the Decker area by a number of mines (not just Spring Creek) would lead to a significant cumulative impact on antelope populations, for reasons explained in volume 1.

It may be true that no single winter range is crucial for large numbers of antelope: taken together, however, the winter ranges are crucial to long-term survival of antelope in the Decker area.

29R

LETTER 29

-8-

regular mining activity and presence of mine personnel, they will utilize areas very near mining resulting in increased visibility. Deer and pronghorn appear to rapidly adjust to mine areas and activities. Mine sites serve as refuges, free from hunting pressures, harassment, and competition with livestock for available forage.

Once accustomed to regular mining activities, the animals appear little disturbed even by blasting events. The "Decker Mine Herd" of mule deer has actually increased over the past three years, with several does producing fawns within the mine area (Biggins 1977, 1978: Mike Jackson personal communication). Similar intensive use is occurring at many other active mine sites in the region. The broken topography created by spoil piles, provides bedding sites, with feeding activities in adjacent undisturbed and reclaimed areas. The improved habitat conditions, protection from hunting and harassment, and mitigation efforts all serve to enhance areas contiguous with active strip mines, increasing many wildlife populations in those areas.

Only removal of specific habitat requirements, which are available in limited amounts, would cause significant decreases in wildlife populations. On the Spring Creek site the most likely significant non-mitigatable impact to wildlife will be the removal of robust sagebrush stands used as wintering areas. Careful attention to fence construction will insure that undisturbed sagebrush stands remain accessible to wildlife.

Populations of antelope, mule deer, and sage grouse would be substantially lowered in the vicinity of the proposed mines, and with the added impacts of existing and projected mines, regional populations would be noticeably lowered." (Page IV-38).

29S

Comments. For all of the same reasons set forth in the last comment, "substantial" or "noticeable" lowering of most wildlife populations appears unlikely due to development of the Spring Creek mine. The three species listed in the above statement are all very mobile. With the vast expanse of physiognomically similar lands in the Decker subregion, the removal over 25 years of approximately 4 square miles of habitat hardly holds the potential for such devastating results. Baseline and monitoring studies have documented that use by these three species is not confined to the permit area during any season. During the winter season, when the potential for debilitating impacts is greatest, mule deer have made very little use of the Spring Creek permit area, with intermittent use by both pronghorn and sage grouse. No flock of sage grouse or pronghorn herd remained on the Spring Creek permit area for a significant portion of any winter. Pronghorn and sage grouse utilize mature sagebrush extensively during the winter. During the three winters of study at Spring Creek, each of these species utilized several areas on and off of the mine site. However, the majority of documented winter range areas utilized by both pronghorn and sage grouse occur outside of the presently approved Spring Creek permit area. It appears likely that the portion of the presently utilized winter range lying outside of the disturbance area can support these wildlife populations. Areas of similar habitats in proximity to previously identified wintering

LETTER 29

-9-

concentrations may provide alternate winter range sites for both pronghorn and sage grouse.

"Mining near Decker would disrupt the most important block of sagebrush habitat in the region, thus reducing populations of species depending on this habitat. (See Wildlife, Chapter II.)" (Page IV-38).

29T

Comments. The few intensive wildlife studies, supported by companies proposing industrial development in the region, do not provide an equitable, comprehensive assessment of the entire region. Given the vast expanses of sagebrush/grassland vegetation within the Northern Powder River region, and the paucity of careful wildlife studies it is very presumptuous to identify an area as "the most important block of sagebrush habitat in the region."

Chapter IV, to the extent it discusses impacts on the antelope population contains several unwarranted statements. The following comments are directed at the Antelope section (Pages IV-39 and IV-40) of the Draft Environmental Statement:

29U

Comments. A great deal of the potential impact to pronghorn can be mitigated. As stated in earlier comments, in the baseline report, and in interim/monitoring reports, pronghorn utilized numerous portions of the Spring Creek study area as winter range. If movement routes are not blocked between sites which have supported winter pronghorn concentrations outside of the disturbance area, these sites will likely be utilized during future winters. Regular movement routes to the east and north of the proposed mine site should allow pronghorn access to all portions of their winter range. Where fenced roads or rail lines are constructed, appropriate fencing design will insure no impediment of pronghorn movements.

The importance and value of any single pronghorn wintering area appears questionable. An ongoing, three-year study of pronghorn, on lands just south of the Spring Creek study area, has documented yearly shifts in winter ranges for all pronghorn herds on their study area (Amstrup 1978). Spring Creek Coal Company's wildlife baseline and monitoring studies have also documented this shifting use pattern. Mr. Amstrup (in personal communications) is of the opinion that pronghorn (at least the populations in this subregion) are nomadic and do not form winter concentrations on specific, traditional sites. Rather they wander throughout the region utilizing areas they encounter which provide their habitat requirements at that particular time. The overall pronghorn range is constricted considerably during the winter season, but still traditional "winter range areas" are not consistently utilized even during that season (Amstrup 1976, 1978).

Chapter IV, to the extent it discusses impacts on the grouse population contains several statements which data now available would show to be much less likely than originally anticipated. The following comments are directed at the Grouse section of the Draft Environmental Statement:

29V

Comments. Sage grouse are by far the most prevalent upland game bird on the Spring Creek study area, and during some seasons

29T According to Beetle (1960) and the Montana Department of Fish, Wildlife, and Parks (Neil Martin, oral commun.), the most significant occurrence of sagebrush (particularly *Artemisia tridentata*) in the designated region is in the Decker subregion.

29V

Other known wintering areas may be able to receive birds displaced from the Spring Creek mine; however, impacts on lekking and nesting areas are probable and could well be significant. The Decker subregion has the largest sage grouse population in the region, and losses of habitat to development would reduce populations in the mine areas by an unforeseeable amount.

LETTER 29

-10-

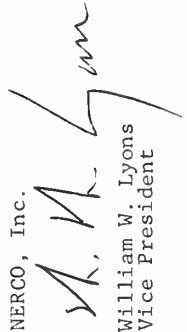
they have utilized the proposed disturbance area intensively. In light of additional information collected on sage grouse over the past two years, the potential adverse impacts should be considerably less than suggested by the Draft Environmental Statement. During all winters of the Spring Creek study, sage grouse have utilized areas other than that near the "Upper Divide Lek." Numerous visits during all winters found no sage grouse within this area. Other wintering areas are much more inaccessible and do not receive the frequency of observation than the "Upper Divide Lek" area obtains. Areas where grouse have been seen in substantial numbers (50-100 birds) include the sage covered benches to the WNW and SW of the winter area on the South Fork of Spring Creek. Eng and Schladweiler (1972) found typical sage grouse winter ranges consisted of "large expanses of dense sagebrush on land having little if any slope," and frequently located on benches between drainages. These are the kinds of areas sage grouse use alternately with the South Fork of Spring Creek wintering area. The South Fork site does form an integral portion of the sage grouse winter range in this area, particularly the westerly portion of the designated wintering area where taller, denser stands of sagebrush occur.

As discussed earlier, there is no short term way to mitigate the loss of winter habitat for the sage grouse. The dense, robust sagebrush stands utilized during this season would require a considerable time lag to develop. Surrounding areas, which already receive winter use by sage grouse, may be capable of supporting the present population once the South Fork of Spring Creek wintering area is disturbed. In any event, the modified mine plan would remove only a portion of the South Fork of Spring Creek sage grouse wintering area. It is unlikely that this minimal disturbance level will greatly impact the sage grouse population.

The foregoing comments are provided because they address certain specific references in the DES with which NERCO would take issue, whatever the circumstances. The fact remains that the Spring Creek Mine is not a "proposed mine," but an existing mine for which the necessary permits have been issued. A more intensive review would undoubtedly produce additional comments. The one comment which deserves greatest attention is that treatment in the Regional Analysis of the Spring Creek Mine as anything but an existing mine is inappropriate.

Respectfully submitted,

NERCO, Inc.



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Vice President

LETTER 30

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August 8, 1979

NORTHERN POWDER RIVER BASIN COAL &
PEARL NINE DRAFT EIS

First, the Northern Plains Resource Council would like to take this opportunity to thank the United States Geological Survey as lead agency, for the timely manner in which they made these documents available.

We understand that in the course of developing documents of this nature, that parameters must be set and certain guidelines followed. What is not understood is the casual and haphazard consideration given to the disruption that will be caused by the compounded or cumulative effects of these projects. This is particularly true when considering hydrological and people-related impacts. The Regional EIS fails to achieve the clearly mandated objective of assessing the regional and cumulative impacts of proposed coal coal mining and related industrial activities.

We feel that the treatment given potential hydrological disruption was cursory and unrealistically optimistic. This attitude as exemplified by the language of optimistic uncertainty is unfounded and careless, particularly when you remember that water is the lifeblood of the agricultural community in this semi-arid region.

What is cause for more concern is the treatment of the socio-economic impacts and the externalities that are an unavoidable by-product.

After reading the Regional EIS, it was impossible to determine whether the communities of Colstrip and Forsyth were going to be significantly impacted, moderately impacted, or not impacted at all. This kind of ambiguity when dealing with the lives and livelihood of these communities cannot be tolerated.

Decision makers must rely on EISs to determine the likely results of their decisions, and if these (EISs) are as lacking and off the mark as these are, then some bad decisions will inevitably be made.

To avoid the Northern Plains being turned into a National Sacrifice Area, these documents must be rewritten to reflect the synergistic effects of the proposed projects in this region.

Our section by section comments and criticisms will follow.

1.

The following represents a section by section breakdown -
of the Regional and Pearl Environmental Impact Statements:

Chapter II

30A II-6. last para. This is in contradiction to what is stated in the North Decker final TREA (p.3-8), which states: Aquifers would be replaced by dragline laid spoils materials in the mined out areas which have greater porosity and permeability than the original material--However, the Regional EIS states: Overburden containing clay materials that swell when wetted tends to produce mine spoils that become relatively impermeable...The Decker mine has a predominance of clays with a relatively high potential for swelling.

30B II-7. para 3. Table III-5 is Table III-4.

30C II-7. last para. In the discussion on overburden states: "mining would break up undesirable layers, but would not greatly dilute the concentrations of undesirable components...If problematic layers equal 15% of the overburden they maintain identity after mining." Sites where this may occur should be identified so that they will be taken into consideration in the mining and reclamation plan.

30D II-16. para 2. States that the consumptive use of water for an individual is .06 acre/ft pr. person yr. Yet, in the Pearl EIS we are informed that 460 people will use 500 acre/ft yr. (p.VII-1. para 2. Pearl EIS). How is this figure arrived at?

30E II-19. para 6. Lead: Since the presence of lead in certain areas of groundwater is twice the maximum level recommended by the Public Health Service, more effort should be taken to determine the source of this lead instead of just stating "source unknown".

30F II-20. para 2. "Industrial waste water from the sludge ponds at Colstrip have no adverse effects, even though they may be re-charging the groundwater system". What evidence is available to merit this kind of blanket statement? We feel that not enough monitoring has been done to reach this premature conclusion.

30G II-36. Air Quality: Beginning on page thirty-five, an extensive quantitative comparison of particulates is made between rural and industrial sites in the area. This section should include a discussion of the qualitative differences between the particulates at the rural and industrial sites. Coal dust is undoubtedly more detrimental to the health than dust from the topsoil. Also included should be a discussion concerning the probable cause of the unexpectedly high particulates in the rural area.

30H II-62. 2. para 2. In discussing clay it should mention the possible effects that high content of clay in the overburden could have on aquifers, i.e. such as impeding the normal downward movement of moisture from the surface.

30A The statements are not contradictory. Although most of the spoils deposited by dragline are more porous than undisturbed overburden, the surface of the spoils which have been regraded and compacted is less permeable than the original soils due to increases in bulk density and loss of structure, pore space, and root channels. Expanding clays in the near-surface spoils contribute to reduced infiltration and percolation rates. Rahn (1976) discusses both increased porosity of the spoils and reduced infiltration rates.

30B The correction is noted.

30C Then sites which may lead to reclamation problems are identified (as in this FES or in other mine plan reviews), the company is asked to revise its proposed plan to mitigate the problem. If the proposed mitigations are not considered to be adequate, special stipulations are imposed by the responsible regulatory agencies before a mining permit is issued.

30D The statement in volume 2 (Pearl mine) is in error.

The figure for the consumptive use of water of 0.06 acre-foot per person per year is correct. Using this, the 460 additional people attributable to Pearl mine would use 28 acre-feet/year.

30E The overburden in the Ash Creek mine, just south of the Wyoming State line, contains anomalously high levels of extractable lead associated with sodic-saline materials. Within the designated region, lead does not occur in concentrations above State suspect levels in the overburden. (See page II-7.) Lead concentrations in spoils water in the Colstrip area appear to be somewhat higher than in other areas (Van Voast and others, 1977) and commonly exceeds the maximum concentration of 0.05 mg/L set by the U.S. Public Health Service.

30F See response 25B.

30G Coal dust may be more harmful to plants and animals than dust from haul roads, unpaved rural roads, and fields, although the differences have not been quantified.

30H See page II-6.

2.

30J II-77. a. para 4. A map showing the Reynolds and Rosebud battlefields along with other discussed historic or cultural sites should be included in th EIS.

30J II-80. para 3. States: "Colstrip and Forsyth are approaching boomtown growth", (population growth too rapid to manage). This statement contradicts others which discuss the impacts felt by these communities as being not significant. (see p. iv.).

30K II-80. para 3. Sheridan is already experiencing boomtown growth due to their "apparent reluctance to plan for rapid growth". Even if this statement is accurate, it seems to equate planning with having the resources available to implement such plans. What is more important however, is that even if the resources were available, planning cannot alleviate all the negative aspects of rapid growth such as increased social stress, rising crime rates, and accelerated family breakup.

30L II-104. 2. para 3. It is pointed out here that "Bighorn and Rosebud counties are critically understaffed with physicians". Not only is this statement a direct contradiction to the supposition that Colstrip and Forsyth are not being significantly impacted, but it is an indication of what has historically been treated as an externality, which it should not. These documents are to be used as decision making tools by the Federal Government, and to ignore problems of this nature is to compound an already critical situation.

30M II-106. 3. para 2. States that "only one out of ten jails meets constitutional requirements" is another example of the kind of "externality" that can no longer be ignored.

30N II-115. The map on this page shows a Railroad from Colstrip to Birney. This is in error, for this line has never been permitted let alone constructed.

30O II-119. Table-44 does not agree with the latest Highway Department figures in Appendix A.

30P II-125. The EIS states that Bunny Chase "has been intensively studied and will probably be removed from the eligibility list". This statement is erroneous since Bunny Chase has been added to the National Registrar. Also the text refers to another site being considered without identifying it, they should do so.

It also seems that there is need for additional survey to identify historic properties in compliance with Executive Order 11593. While the Bunny Chase site has been mitigated, there seems to be no evidence that determinations of eligibility have been requested on the other archeological sites in the project area. The regulations set forth in 36 CFR 800 need to be followed on these sites, and any additional sites identified as a result of the survey referred to above. The final EIS should reflect the Advisory Council's comments on the effect of the undertaking and contain the memorandum of agreement as to mitigation of effect. We feel your draft was incomplete and premature in this matter, indicating you did not comply with Section 106 of the Historic Preservation Act, "in the early stages of project planning".

30I Cultural resources which would be affected by the proposed mines are described in sufficient detail in the site-specific EIS's. The battlefields would not be affected by coal development.

30J The statement on page IV-44, paragraph 3 refers to the social impacts of the proposed developments; the statement on page iv, to financial impacts; on page II-80, to recent history. Financial impacts, though part of social conditions, are discussed separately for analytic purposes. Social impacts, in total, would be significant, although financial impacts alone would not be significant.

30K Noted.

30L The problem is not ignored--volume 1 points out that the proposals under consideration would add to the difficulty of providing adequate social services. See the summary (p. iv), p. IV-56, and tables IV-14 (p. IV-58) and IV-16 (p. IV-60). Fiscal impacts, not social impacts, are anticipated to be not significant. The lack of an adequate number of physicians in Big Horn and Rosebud Counties is not entirely due to coal mining; the problem existed before large-scale mining resumed. (See p. II-80, II-82.)

30M In this case, the situation predicated industrialization and was caused not by growth but by court rulings to ensure adequate security in jails.

30N The comment is correct; the rail segment from Colstrip to Birney is projected (broken line) and is considered only in the discussion of the Montco line in chapter VIII.

30O Table II-44 includes the most up-to-date figures available at the time of compilation for the road crossings in the Colstrip and Decker areas. The more recent figures in Appendix A of your letter are appreciated, although they do not alter the conclusions stated in volume 1.

30P The Bunny Chase site has been determined eligible for nomination to the National Register, but it has not been formally nominated and, consequently, has not been added to the register. The Devastation Shelter site is also being considered for eligibility for nomination to the register.

The mine plan must comply with all the regulations of 36 CFR 800 before it can be approved. The Office of Surface Mining is the Federal regulatory agency with primary responsibility for ensuring such compliance. (See also response 18A, and volume 4, responses to letters 18 and 22.)

3.

30Q II-126. para 3. Esthetics: By what standards is the area to be impacted not considered esthetically distinctive?

Chapter III

Two of the controlling laws are noted below as they seem to have been partially ignored in the draft FIS.

30R III-7. d. Alluvial Valley floors: Under Federal Regulations 30 CFR 715.17. (j), surface mining operations in or adjacent to designated alluvial valley floors must be planned and conducted to "preserve the essential hydrological functions of these alluvial valley floors throughout the mining and reclamation process". This proves to be of particular importance when considering Little Youngs Creek and the Pearl mine, both of which raise serious potential conflicts with this section of the law.

30S III-12. 4a. The Migratory Bird Treatment Act, 40 stat. 755, as amended, 44 stat. 1555, and the Bald Eagle Protection Act of 1969, 16 USC 688, provide "that no mining operations are to be permitted where the activities would harm or disturb ...raptorial birds, including bald or golden eagles."

Chapter IV

30T IV-2. a. para 3. How will Spring Creek mitigate problems of erosion and sedimentation?

30U IV-3. para 4. This discussion that mining or reclamation at the North Decker minesite could disrupt an "even successful reclamation program at Spring Creek" is one of the few attempts this document has made at assessing the cumulative effects of projects in the area. We find that the lack of consideration given the synergistic effects of these projects on the Northern Powder River Basin to be a glaring example of this documents inadequacy as a decision making tool.

30V IV-5. Hydrology: For a Regional study of this nature, the language used should not be so unprofessional. "mines would use little water relative to what would be available for other anticipated uses, and they would probably not cause enough degradation to interfere with other uses. Total demand...would probably nowhere exceed available supply. Impacts on availability and quality of water would probably be temporary and local." We feel that professional scientists should not assert things they are unsure of, and that such a high degree of uncertainty should dictate caution, after all when discussing hydrology you are referring to the backbone of the agricultural community.

30W IV-6. para 2. and last para. The following are two more instances of appalling language and an utter disregard for Western water values. "It is possible that a supply could be obtained from wells tapping clinker beds that probably crop out". "increases of unknown magnitude (a best guess is that they would be slight)".

30Q The area to be impacted is designated as class II scenery according to the BLM Visual Resource Management System, as noted on page II-126 of volume I. Copies of these studies are on file at the Miles City District Office, BLM.

30R Data are being gathered on the alluvium along Youngs Creek and Little Youngs Creek. If they are determined to be alluvial valley floors, the regulations relating to mining and restoration in such valleys must be observed.

30S Volume I is in error--the correct title is the Migratory Bird Treaty Act.

30T Detailed requirements to mitigate erosion and sedimentation problems are included in special stipulations 7 through 12 of the mining permits issued to Spring Creek Coal Company by the Montana Department of State Lands on April 11, 1979, and by the Department of the Interior on May 7, 1979.

30U This statement addresses synergistic and cumulative effects to the degree possible, based on available information.

30V The words "probably" and "possibly" were used intentionally to convey our best professional judgement in the absence of data. Unfortunately, not all available data were used or acknowledged in volume I, Hydrology. Several studies have been published concerning the impacts of coal development in southeastern Montana on surface and ground water: Botz (1978); Van Voast (1974); Van Voast and Hedges (1974, 1975); Van Voast and others (1975, 1976, 1977, and 1978).

Taking those reports into account, the summary statement in chapter IV, Hydrology, is revised as follows:

The intermediate level of coal production would cause very little conflict with other concurrent uses of water in the six-county study area (fig. IV-1). Existing, proposed, and projected mines would use little water compared to what would be available for other anticipated uses, such as irrigation and municipal water supplies, and they would not cause enough degradation of water to interfere significantly with other uses. Total demand in the study area would not exceed available supply. Impacts on availability of water would be temporary and local. Water levels in wells within a mile or two of the proposed mines would be lowered as much as a few feet, especially during mining; similarly, a few springs would be destroyed or degraded by the mines. Mining companies would be legally required to replace degraded supplies.

4.

- 30W IV-6. last para. "The new town would require about 720 acre-feet annually." Which new town are you referring to, and how was this 720 acre/ft yr. figure arrived at?
- 30X IV-9. next to last para. States that: "after bond release, reclamation failures would most certainly add perhaps negligibly to large quantities of sedimentation...". What kind of comment is this? The statement "perhaps negligibly" is indicative of the fingers crossed attitude towards hydrological disturbance.
- 30Y IV-39. By using the figures given in the Regional EIS the antelope in this area have virtually been eliminated.
- 30Z IV-40. Grouse wintering and lek-nesting should be looked at as one interdependent complex.
- 30AA IV-41. 4. Raptors: This section states that a pair of golden eagles might well be displaced. This would seem to violate 16 USC 688, the Bald Eagle Protection Act of 1969 which provides that "no mining operations are to be permitted in any area where the activities would harm or disturb...raptorial birds including bald or golden eagles, or their nests."
- 30BB IV-44. para 3. States that impacts in Rosebud County would be "moderately significant". Somewhere in this document, a decision should have been made whether the impacts felt will be moderately significant, not significant(p. iv), or are approaching boomtown growth, i.e. population growth to rapid to manage.(p. II-80)
- 30CC IV-48. c. para 2. States: "It is not possible to foresee what effects the proposed developments would have on the basic social units of the study area..." How can such a statement be made right after referring (p.IV-44) to the Page, Arizona experience, or when looking at the results of large scale development in Appalachia? If that isn't enough documentation; then it is paramount that more research be undertaken before the social fabric of the area is torn apart.
- 30DD IV-65. 1. para 3. States:" the increase in train traffic due to the proposed mines would slightly increase the frequency of vehicle train collisions...unless mitigated." Have any of the projects involved proposed to mitigate this anticipated increase?
- 30EE V-2. para 2. States that the decade or so of rapid growth due to construction of the generating units would likely be followed by a relatively minor economic bust cycle in Colstrip and Forsyth. First, what is a relatively minor economic bust cycle? Secondly, we feel the "bust" would be disastrous. What must be taken into account is the existing agricultural base, the very valid questions concerning the long term potential for reclamation and the possible permanent loss of a water resource. This kind of statement seems to present a total disregard for the present lifestyles and values of the region.

Ground water in mine spoils would be of poorer quality than in undisturbed aquifers. Some water from backfilled areas could move into surrounding aquifers hydraulically downgradient. Because of the low hydraulic conductivity of most coal and overburden aquifers, the movement of ground water from mine spoils would be very slow. Degradation of water quality would be locally detectable but probably not significant.

Neither the mines nor the populations they introduced to the study area would contribute appreciably to degradation of water quality except for increases of unknown magnitude in dissolved solids in wells within a few miles of the mines and for slightly and locally increased sedimentation during construction of mine facilities and mine-induced housing and railroads.

30W The projected new town of Spring Creek in southern Big Horn County is discussed at the beginning of chapter IV. The figure for water requirements for the new town should be about 600 acre-feet/year, based on a population of 3,000 and a total water requirement of 0.2 acre-foot per year per person (as opposed to consumptive use of 0.06 acre-foot per person per year--see also responses 30D and 30PP).

30X Text has been revised. See response 30V.

30Y Antelope in the Decker subregion would be reduced about 20 percent if winter habitat loss from the mines were coupled with a severe winter comparable to those of 1977-78 and 1978-79.

30Z Wintering, lekking, nesting, and other activities are considered as part of the habitat complex.

30AA The loss of a portion of the golden eagle's hunting territory would not necessarily cause the loss of the pair.

30BB See response 30J.

30CC See response 20M.

30DD The route of the rail spur to the Spring Creek mine has been changed to avoid crossing Highway 314. The exact route of the spur to the Pearl mine is not known but it would have to cross the highway. Both mines would still contribute to increased traffic on the main line east to Gillette and beyond, and we know of no proposals to mitigate impacts on that route. Grade separations are being planned at Decker and at Colstrip by the Montana Department of Highways.

5.

- 30FF VII-last para. The EIS fails to address the question of what would happen to the "new town" after mining.
- 30GG VIII-3. Why is the CX mine included in the low level of production?
- 30HH VIII-17. 2. Hydrology: It is stated here that that at the high level of production there would be "no measurable deterioration in surface water quality would occur at this level of production". Yet in the very next paragraph it states that "Evaporation losses from the Moorhead Reservoir would be 60,700 acre/ft annually". The loss of this much water would definitely increase the salinity of the reservoir. This statement suggests that there is no correlation between salinity and water quality.
It is also stated that this loss through evaporation is equal to 21% of the average annual unappropriated flow. How can this figure be arrived at before the completion of the water adjudication process?
- 30II VIII-21. 6. Wildlife: States that the "CX Ranch mine would compound the severe impacts of the Spring Creek, Pearl. mines on antelope." This is the kind of awareness that should be exhibited throughout the EIS. It has been stated that man can not just do one thing, and it is the Regional EIS's apparent ignorance of this concept that make it ineffectual as a planning or decision making tool.
- 30JJ VIII-22. 7. para 2. If the rapid population growth mentioned here would not be due to the proposed developments, then what would cause it?
- 30KK VIII-23. 8.a. 2) Rosebud County. This section states that: "the greater level of energy development would contribute to a more stable economic atmosphere than under baseline or intermediate conditions." Please define a more stable economic atmosphere? This statement seems to ignore the fact that this same high level of development would contribute to the changing tax base, and also accelerate inflationary trends already in existence.
- 30LL VIII-25. para 1. When discussing the fact that Wyoming would be relieved of providing public service needs, it should be noted here who would be supplying these services.
- 30MM VIII-29. 11. para 2. Coal Slurry: Where did the figure of 88 million tons of coal come from.
- 30EE "Relatively minor economic bust cycle" refers to the temporary downturn in total employment after the construction workers for Colstrip units 3 and 4 leave. (See figure IV-13, topmost curve.) Effects would be similar to what happened after construction of units 1 and 2. Some businesses would experience temporary hardships, and some public works would have excess capacity, but the bust would not be disastrous
- 30FF The new town would remain populated as long as mining in the Decker area continued. As discussed in chapter VI of FES 79-10 on the Spring Creek mine, given the coal reserves in the Decker area, mining could conceivably continue locally for over a century assuming a production rate of 100 million tons/year--far greater than the current rate.
- 30GG The low level of coal production includes only mines which would not use Federal coal. A 3 mty mine at the CX site is feasible using non-Federal coal.
- 30HH The second sentence under Hydrology on page VIII-17 refers only to the effects of the proposed developments, which would not affect the Powder River. The evaporative loss from Moorhead Reservoir would indeed increase salinity of the already poor quality of water in the Powder River. The 21 percent applies to the present unappropriated flow of the Powder River.
- 30II Cumulative impacts were identified wherever possible; the available information did not suggest the kinds of interactions noted in the comment in all cases.
- 30JJ It would be due to coal-related developments on existing leases other than the proposed developments. This "baseline" coal production is actually greater than the production from the proposed mines. See also figure I-2.
- 30KK The high level of coal development would spread new construction in Rosebud County over a longer period, thus avoiding the short-term employment fluctuations projected under the intermediate level of development.
- 30LL The public service needs would be provided by Big Horn County, the State of Montana, School District No. 1, and the projected new town of Spring Creek. Until the town were incorporated, special purpose taxing jurisdictions (water and sewer, rural fire, etc.) would be created.
- 30MM The last part of the third sentence in paragraph 2, page VIII-29, is corrected to read: "...would amount to 85 million tons of coal per year, or about 46 trains per day, based on projected coal exports by 1990."

LETTER 30

APPENDIX A

State of Montana, Department of Highways railroad accident data from 1-1972 to 5-1979. For the Counties of Bighorn, Rosebud, and Custer.

LETTER 30

B.N. 103848A (1 - Injury)	Farm	6.6 S. Lodge Grass	9-16-77	None	
B.N. 103839B (No Injuries)	Co. Rd.	.7 S. Garryowen	12-10-76	X-Bucks	
<u>Big Horn County - Continued</u>					
<u>Crossing No.</u>	<u>Road</u>	<u>Location</u>	<u>Accident Date</u>	<u>Xing Protection</u>	
B.N. 103855K (1 - Injury)	Private Rd.	5.0 N. Wyola	9-16-77	X-Bucks	
B.N. 103855K (1 - Injury)	Private Rd.	5.0 N. Wyola	4-29-79	X-Bucks	
B.N. 103980X (No Injuries)	?	Hardin Ave.	7-22-76	Unknown	
B.N. 104037E (No Injuries)	FAS 313	0.2 S. Hardin	7-6-77	Fl. Lights	
B.N. 104038L (No Injuries)	Center Ave.	Hardin	4-10-75	X-Bucks	
B.N. 104040M (No Injuries)	Bis. Rte. 1-90	Hardin	9-7-77	X-Bucks	
B.N. 104064B (No Injuries)	Private Xing	1.8 S. Crow Agency	2-13-76	Unknown	
B.N. 98833W (No Injuries)	FAS 314	2.0 E. Decker	3-4-76	Fl. Lights	
B.N. 98833W (No Injuries)	FAS 314	2.0 E. Decker	7-31-77	Fl. Lights	
Milw. 394100S (1 - Injury)	Co. Rd. Main St.	Mildred	1-26-78	X-Bucks	
<u>Rosebud County</u>					
B.N. 87403F (No Injuries)	10th Ave.	Forsyth	4-14-77	Fl. Lights Gates	
B.N. 87403F (1 - Injury)	10th Ave.	Forsyth	1-3-76	Fl. Lights Gates	
B.N. 87403F (1 - Injury)	10th Ave.	Forsyth	3-23-75	Fl. Lights Gates	
B.N. 87403F (No Injuries)	10th Ave.	Forsyth	11-6-76	Fl. Lights Gates	
B.N. 60515B (1 - Fatality)	Mont. 315	18.7 S. Forsyth	6-12-75	X-Bucks	
B.N. 60533Y (1 - Injury)	Main St.	Colstrip	9-29-77	X-Bucks	

LETTER 30

Rosebud County - Continued

<u>Crossing No.</u>	<u>Road</u>	<u>Location</u>	<u>Accident Date</u>	<u>Xing Protection</u>
B.N. 60533Y (1 - Injury)	Main St.	Colstrip	10-10-73	X-Bucks
B.N. 60544L (No Injuries)	Main St.	Colstrip	3-6-77	X-Bucks
B.N. 60544L (No Injuries)	Main St.	Colstrip	9-23-77	X-Bucks
B.N. 60547G (2 - Injuries)	Cottonwood Ave.	Colstrip	3-18-79	Unknown
B.N. 60509X (No Injuries)	Mont. 315	14.2 S. Forsyth	12-17-73	X-Bucks
B.N. 92643X (2 - Fatalities)	Main St.	Rosebud	3-15-74	Fl. Lights Gates
B.N. 92643X (1 - Injury)	Main St.	Rosebud	2-10-72	Fl. Lights Gates
B.N. 60547G (No Injuries)	Cottonwood Ave.	Colstrip	9-17-78	None
B.N. 87404M (No Injuries)	Highway 12	Forsyth	6-15-76	Fl. Lights
B.N. 87404M (2 - Fatalities)	Highway 12	Forsyth	3-6-73	Fl. Lights
B.N. 87402Y (No Injuries)	Main St.	Forsyth	9-16-77	Fl. Lights
B.N. 87402Y (No Injuries)	Main St.	Forsyth	4-14-77	Fl. Lights
B.N. 60540J (1 - Fatality)	Big Sky Mine Xing	7.0 S. Colstrip	10-24-73	Fl. Lights
<u>Custer County</u>				
B.N. 92658M (No Injuries)	4th St.	Miles City	2-22-74	X-Bucks
B.N. 92658M (1 - Injury)	4th St.	Miles City	5-4-77	X-Bucks
B.N. 92665X (No Injuries)	Co. Rd.	Miles City	12-29-77	X-Bucks

LETTER 30

Custer County - Continued

<u>Crossing No.</u>	<u>Road</u>	<u>Location</u>	<u>Accident Date</u>	<u>Xing Protection</u>
Milw. 394135T (No Injuries)	Co. Rd.	2.8 W. Miles City	3-1-79	X-Bucks
Milw. 399092U (1 - Injury)	No. Mont. St.	Miles City	8-17-76	Fl. Lights
Milw. 399092U (2 - Injuries)	No. Mont. St.	Miles City	11-13-73	Fl. Lights
B.N. 92660N (No Injuries)	8th St.	Miles City	10-21-76	Fl. Lights
B.N. 92660N (1 - Injury)	8th St.	Miles City	5-4-77	Fl. Lights
B.N. 92660N (No Injuries)	8th St.	Miles City	3-7-78	Fl. Lights
B.N. 92662C (No Injuries)	Tenth St.	Miles City	8-5-77	Fl. Lights
B.N. 92664R (No Injuries)	Leighton Blvd.	Miles City	12-1-77	Fl. Lights
B.N. 92656Y (No Injuries)	Spotted Eagle Road	0.2 W. Miles City	1-22-72	X-Bucks
Milw. 3990995 (No Injuries)	7th St.	Miles City	12-13-72	Fl. Lights
Milw. 399107G (3 - Injuries)	Co. Rd.	0.5 W. Miles City	3-14-73	X-Bucks

Powder River Basin Resource Council

48 North Main Sheridan, Wyo. 82801 (307) 672-5809



Glenn Malmberg
Federal Tax Force Leader
U.S. Geological Survey
P.O. Box 1135
Billings, MT 59103

August 7, 1979

Dear Mr. Malmberg:

The Powder River Basin Resource Council (PRBRC) would like to submit the following comments on the DES of the Northern Powder River Basin. This statement was made available to the public on July 13, 1979. The comments will be divided into two sections; one section will deal with the DES generally, while the other will relate to the specific socio-economic impacts to be experienced by the city of Sheridan and northern Wyoming.

SECTION ONE

- 31A 1) The legend for figure I-1 needs to include an indication of what the designated region is. It also needs to explain "adjacent area."
- 31B 2) Figure I-1 has omitted the Sheridan Enterprises. It is also missing from the text. Since the Mine and Reclamation Plan has already been through DEQ review, this mine should be considered as an imminent development.
- 31C 3) Basin Electric has proposed a 1000 MW power plant in the area. This facility should be included in the analysis.
- 31D 4) At the intermediate level of production, the DES figures the designated region will produce 53.2 million tons per year in 1990. However, the medium coal leasing scenario from the recently published Coal Management Program sets the rate in 1990 at around 72 million tons per year. Obviously the DES has not considered the coal leasing program to be instituted by the Department of Interior. Leasing must be fully discussed in the FES before any rational decisions are made.
- 31E 5) The high level of production scenario still disregards the possibility of renewed leasing. This is an untenable position.
- 31F 6) One of the central flaws of the DES is the description of an operating mine as "proposed." On page I-5 the Spring Creek Mine is listed as "proposed" when it is already under construction. Clearly, the Secretary of Interior has jumped the gun and approved a mine prior to the fulfillment of the provisions of NEPA.
- With the Spring Creek Mine already approved, over 50% of the proposed

31A See revised caption of figure I-1. The dotted area indicates the designated region. See chapter IX, Clarification of Scope and Purpose, and the back outside cover of volume I. Adjacent areas include roughly the remainder of Big Horn, Treasure, Rosebud, Custer, and Powder River Counties, Montana, including the Northern Cheyenne and Crow Indian Reservations, and Sheridan County, Wyoming.

31B Projected mines are not shown on figure I-1. The Sheridan Enterprises mine was considered in the analysis, especially in the sections on fiscal and social conditions in Sheridan County, Wyoming.

31C Basin Electric's proposal has not been advanced in any concrete form. An attempt to include it in the analysis would be premature.

31D,E Coal production from the designated region and adjacent areas would total 88 mty by 1990 under the intermediate projection used in this environmental statement. A environmental statement on the Federal Coal Management Program has been completed, and a statement on regional leasing is under preparation by the U.S. Bureau of Land Management in expectation of a regional Federal coal lease sale in April 1982.

31F See chapter IX, Clarification of Scope and Purpose, and response 29A. FES 79-10 on the Spring Creek mine fulfilled the provisions of NEPA for that mine.

Glenn Malinberg
August 7, 1979
Page Two

coal production and attendant impacts are beyond public influence.

The DES throws into question the whole purpose of regional impact statements since proposals on a site specific basis are being approved prematurely.

Section 1500.6 (d)(1) from the NEPA Guidelines states, "In many cases, broad program statements will be required in order to assess the environmental effects of a number of individual actions on a given geographical area..."

The word action is used purposefully to trigger the duplicate language in NEPA which states that "...all federal agencies shall...include in every recommendation or report on proposals for legislation and other major federal actions...a detailed statement on the environmental impact of the proposed action."

Clearly the CEQ felt, and USGS and DSL have concurred, that regional or program statements are necessary to adequately describe the full impact of a Federal action. But the process is being circumvented. The regional statements should come prior to the site-specific, as the CEQ finds;

(d)(1) "Subsequent statements on major individual actions will be necessary where such actions have significant environmental impacts not adequately evaluated in the program statement."

These arguments are borne out by the most recent CEQ regulations (July 30, 1979) specifically Sections 1502.4 (c)(1) and 1502.20.

31G 7) What will be the impacts of the proposed "synfuel" plants to be sited in the Northern Powder River Basin? While plans are yet on the drawing boards, the high production scenario should examine the possibility of coal conversion facilities.

31H 8) Between pages I-8 and I-9, the DES totally contradicts itself. On page I-8, permit applications for mines and expansions which were not received were not to be considered for approval in the EIS. But on page I-9 the Decker North Extension Application is recognized, and yet the statement has not considered it for approval. The Decker North Extension must be included in the FES (or a supplement and then an FES) due to the substantial impacts involved, and the coincident timing with other federal actions.

31I 9) The population figures on page II-81 have been poorly researched, and are not supported by the latest University of Wyoming study. The Center for Policy Research in Laramie has predicted that the Sheridan County population will be at 40,000 individuals in 1990 with a low level of development, and 50,000 with a faster rate of growth. This study must be consulted and included in the FES.

31G The high level of development assumes 1,330 MW of new coal-fired generation at two sites by 1990 (Colstrip unit 5, 330 MW; Prairie Dog Creek, Wyo., 1000 MW). Admittedly, those plants are speculative. It would be even more speculative to assume synthetic fuel plants in the region before 1990, even though the production of synthetic fuels has been proposed by the Federal government.

31H The Decker North Extension is covered in FES 77-20 prepared by the U.S. Department of the Interior and the Montana Department of State Lands. The permit application is being reviewed separately by State and Federal regulatory authorities.

31I The Institute for Policy Research study may have included growth in other sectors, such as tourism and uranium mining in Johnson County, which was not included in the baseline projections in this statement.

31J The application of Best Available Control Technology (BACT) is defined by EPA on a case-by-case basis. EPA has not yet defined BACT for the Pearl mine. The violations are based on modeling and would have to be verified by the regulatory agencies. Some combination of fugitive dust controls may be required to meet ambient air quality standards; however, surface coal mines may be exempt from PSD review. (See comment 36B.)

31K There are several indications that plans for the new town should be taken seriously. A draft environmental impact statement is in the final stages of preparation by the Montana Department of Health and Environmental Sciences; the townsite has been approved by the Big Horn County Commission; in November, 1979, the few local residents voted to create a water and sewer district.

31L The statement on page IV-47 does not mean that the per-capita cost of all government services declines in all cases. Where major expansion of facilities (water, sewer, schools) is triggered by growth, costs would undoubtedly increase. Preliminary work by the Department of Agricultural and Applied Economics at the University of Minnesota (Andrea Lubov, oral commun.) indicates that per-capita costs of some services in some small towns decrease with growth. A survey of Montana counties by the authors shows that per-capita government expenditures are lower in the more populous counties than in the less populous counties.

Glenn Malmberg
August 7, 1979
Page Three

31J 10) The figure IV-8 shows Montana mines violating Wyoming air quality standards. What is proposed to avoid this intolerable condition?

31K 11) Many of the growth projections for Sheridan and northern Wyoming are based on the development of a "new town" in Montana. According to the draft EIS, "Impacts in Sheridan would probably be less severe than those of the past few years, because the new town would draw many of the newcomers away from Sheridan." Thus the DEIS assumes on p. 5-1 that the proposed mines "would contribute slightly to the moderate impacts in Sheridan". If the new town is not built, the DEIS states that the "social problems probably would be concentrated in the Sheridan urban area". (p.8-10).

Has the federal government received any evidence from the proposed town's developers that a new town is planned? A number of other local government officials have expressed doubt whether such a town will be built. Even if the town is built, settlement by miners is unlikely. When the "services available in Sheridan far exceed the quantity and quality," there that will be available in a new town." (Pearl DEIS, III-25).

31L 12) The second paragraph under subsection (b) on IV-47 states "As impacted communities increase in size, economies of scale would lower the per capita costs of some government services. This would reduce tax burdens and/or increase the quality of service." How can such a conclusion be justified in light of the problems encountered by a number of boom towns in Wyoming, such as Gillette, where government is hard-pressed to provide any services other than education?

31M 13) The third paragraph under subsection (b) on IV-47 states: "Some elderly may be able to sell their homes at high prices and improve their standard of living in rental or townhouse developments, or by migrating out to lower cost areas." This reasoning is also fallacious: population increases place a greater demand on rental developments and lead to increased rental costs. Will those with a static income be able to profit or even maintain their standard of living in such a case (already senior citizens in Sheridan are being forced out of their homes)?

31N 14) The Northern Powder River DEIS fails to address the impacts of development after the coal is gone -- that is, will there still be a sufficient population in the area to utilize all the facilities and services which must be built for them now? What kind of long-term economic base can be established in the region?

31O 15) Has the Bureau of Land Management considered implementing socioeconomic thresholds for the Management Framework Plan (or Resource Management Plan) for the appropriate areas in the Northern Powder River region, so that development in the region can be phased in, thereby avoiding the most severe socioeconomic impacts to Sheridan County?

31P 16) The DEIS for the Northern Powder River Basin was issued prior to the July 30, 1979 effective date of the final NEPA regulations formulated by the Council on Environmental Quality. Therefore, these regulations do not govern the DEIS content in either substance or procedure.

Services which can often be provided more efficiently include emergency services, sewer and water systems with spare capacity in a central plant, schools with low student-teacher ratios, and administrative offices. A symposium held in February 1979 by the city of Gillette, Campbell County, and the Institute for Policy Research pointed to the successful ways in which the community has served the local public, including extensive renovation of streets, curbs, gutters, and storm sewers; a new indoor multipurpose recreation center; and a model alcohol-intervention program.

31M Volume 1 states that some elderly people would benefit. Many, if not most, would suffer a lower standard of living. We do not know how many older people would benefit from development or how many would reduce their losses through the means described in volume 1. The benefits are mentioned in order to show that not all effects on older people would be adverse.

Some people who move into subsidized housing may prefer living with those of similar age. They may be better served by health, recreation, and nutrition programs in group situations. Some people on Social Security may be able to take advantage of increased wage rates and earn supplementary incomes up to the limits allowed.

31N Table IV-16 on page IV-60 shows how much of the needed improvements in facilities must be "soft;" that is, designed to serve a temporary population. The question of what may happen if coal mining declines in the region is addressed in general terms on page VI-2. An economic bust cannot be predicted although one could occur; much of what would happen beyond the lives of the mines now under consideration depends on the future demand for coal. If new electric generating units are built, if old units are recapitalized, or if new coal conversion plants (such as for synthetic fuels) are built, the coal resources in the region would allow continued development for many decades.

31O The BLM is considering using social and economic thresholds in its planning if the approach proves useful and practical.

31P Federal decisions on the mine plans will be made by the Office of Surface Mining, Department of the Interior. The decision records required under 40 CFR 1505.2 will be prepared by OSM and will include careful consideration of information in the site-specific EIS's and this regional statement.

Glenn Malinberg
August 7, 1979
Page Four

But, the exemption from application of the regulations apply solely to the DEIS and FEIS. Provisions of a public record by DOI is not excluded in Section 1506.12; thus, a statement of the proceeding must be made available to those desiring to ascertain the substance of the NEPA decision process. Also, according to Section 1506.12 of the new Rules and Regulations: "These regulations shall apply to the fullest extent practicable to ongoing activities and environmental documents begun before the effective date."

PRERC therefore asserts that the Department of Interior, in order to fulfill the objectives of NEPA, must comply with section 1505.2 of the CEQ regulations. This section mandates that each agency shall prepare a concise public record of its decision, identify the alternatives considered by the agency in reaching that conclusion, and assure that all practical means to avoid or minimize environmental harm have been adopted.

LETTER 31

Section Two: Socioeconomic Impacts on Northern Wyoming

Development of mines in Montana while the induced population growth occurs in Wyoming is a unique problem in the Northern Powder River Basin. We feel that:

- 1) the impacts of this development to Wyoming have not been sufficiently described and,
- 2) methods of mitigating or avoiding impacts have not been adequately examined.

These findings are the result of a meeting sponsored by the Powder River Basin Resource Council on September 5, 1979. Groups represented included the Senior Citizen Coordinating Council, Department of Public Assistance and Social Services (DPASS), the School System, ranchers, local, state and Federal government agencies, as well as PRBRC.

31Q

HOUSING: Sheridan is currently plagued by a severe housing shortage. Particularly hard hit are those with low and static incomes who cannot find adequate housing due to the current influx of people and capital.

Volume 1 examined housing as a constraint on development on pages II-109 and IV-59.

31R

TRAFFIC: Despite assurances in the DES that "experience with growth has given these communities greater ability to deal with change" (IV-42), the city of Sheridan has a tremendous traffic problem that it has been unable to rectify. Even if the new town were built, workers would "probably use the facilities in the Sheridan urban area" (IV-44). Difficulties will be magnified by further growth and will diminish the marginal resources which Sheridan now possesses.

The problems will still exist and will still demand solution, as the comment notes.

31S

SOCIAL SERVICES: The problems of rapid population growth and limited tax base (partially attributable to coal revenues and income tax going to the state of Montana while the workers use the services of Wyoming) has put great pressure on Northern Wyoming's social services. Currently, DPASS is understaffed, needing 30% more workers than are presently available. It is concentrating workers in crisis situations and cases where they are federally mandated to intervene. Problems of lesser urgency, such as alcoholism and youth conflicts, must be by-passed and thus often develop into more serious situations.

Your concern is noted. Table II-37 on page II-106 shows additional staff and space needs for the Sheridan mental health center.

Compounding the staff shortages is a frequent staff turnover (approximately

two years) resulting from strenuous working conditions and pay that is not commensurate with other available jobs.

31T SCHOOLS: Sheridan has exhausted its bonding capacity and is currently faced with shortages of buildings and facilities. Even assuming no growth, as the elementary students of school district number one (the product of the energy population boom) advance to upper grades, more facilities will be required.

31U Special education students are not receiving adequate treatment due to lack of space and funds. 75% of the students in school district #1 are currently being bused to school. This severe financial and time consumption is exacerbated by unrestrained and haphazard growth which causes buses to cover increasingly larger areas. The DES should consider these and other similar, but unresearched consequences of rapid growth.

31V AGRICULTURE: The assumption stated in the DES that ranchers and farmers in Sheridan County "have already lost their political and social dominance so it would not change the existing cultural situation" (IV-47), is biased and absurd. The social and economic situation in Sheridan is dynamic and constantly susceptible to change. As agricultural land is taken out of production due to energy related development such as subdivisions, power lines and railroads, the farmers and ranchers find themselves in an ever worsening position. While skilled workers in the area have taken advantage of higher wages offered by mining companies, the qualified labor pool to agriculture has declined substantially.

Despite the loss of land and help, the farmers and ranchers are viable members of the community. Further non-renewable energy development will place additional social and financial burdens on the region's largest renewable and self-sustained economy: agriculture.

31T School District No. 1, not Sheridan County or City, has exhausted its bonding capacity. The remainder of the comment is correct.

31U The lack of a comprehensive plan for siting subdivisions will create serious problems for local officials. Haphazard growth also makes fire, police, and ambulance services more difficult and increases costs for water, sewer, and transportation systems.

31V It is true that farmers and ranchers are still members of the community; it is also true that some of them will experience financial and social losses due to coal development. The studies by Gold and by Thompson cited in volume 1 show that the ranchers and farmers have lost their former dominance of local culture. This does not mean that they are no longer an important part of that culture. The statement on page IV-47 contrasts the situation in Sheridan County, where mining is not new, with areas where mining would introduce new cultural changes.

31W The Montana Legislature would have to pass an authorizing act to transfer Montana mine revenue out of the State. This is unlikely.

MITIGATING IMPACT: The PRBRC feels that the following impact mitigation suggestions must be fully considered in the FES.

- 31W 1) What are the reasonable possibilities for returning revenue from the mines in Montana to the impacted areas in Wyoming?
- 31X 2) What is the possibility of creating a Regional Energy Coalition which would use the Old West Regional Committee as the foundation for this group? This option could reduce impacts of energy development that involve several states.
- 31Y 3) What are the legal avenues open to Wyoming if it wished to require two years worth of facility taxes be paid in advance by a mine? This would allow communities the opportunity to prepare for impact before it occurs.
- 31Z 4) Since problems with coal mines and related developments are not necessarily constrained to the arbitrary reclamation bond time, should there be an emergency fund created for future coal related problems?
- 31AA 5) Can mineral royalties from federal lands be returned to all states involved with mining consequences, rather than those states in which mines are located?
- 31BB 6) Do not allow development of proposed mines until methods are in place which will allow Sheridan County to cope with adverse socioeconomic impacts from the development in Montana.

Thank you for this opportunity to comment.

Comments prepared by: Reed Zars
Chilton Latham
Grant Parker
staff, PRBRC
48 N. Main
Sheridan, WY 82801

31X The Old West Regional Commission is not authorized to require funds from one State for use in another and so could not transfer funds from Montana to Wyoming. The Commission could fund a project to research techniques for the mitigation of interstate energy impacts.

31Y According to the Wyoming Taxpayers Association (Bill Williams, oral commun.), Wyoming law does not allow for collection of a tax obligation before it is due. Governments may issue revenue anticipation bonds which allow them to spend money in advance of development and then pay back the bonds out of future taxes.

31Z The duration of reclamation bonds is not arbitrary-- it is tied to the accomplishment of reclamation according to legal standards. A bond must remain in effect at least 5 years after the last reclamation procedures. (See chapter III, Federal and State Laws, Soils and Vegetation.)

A reclamation bond could not be refunded if major problems still existed at a mine. Reclamation problems could possibly arise after initially successful reclamation and consequent bond release. The suggested emergency fund may be an appropriate means of handling any such problems.

31AA No, however, Sheridan County may be eligible for Federal impact assistance even though the money would not come directly from royalties or other taxes paid by Montana mines.

Fifty percent of Federal mineral royalties goes to the State. Of the 50 percent held by the Federal government, 80 percent goes to a general reclamation fund that was created by the Reclamation Act of 1902; the other 20 percent goes into the general fund. Wyoming has already received impact assistance through the Farmers Home Administration 601 Program, and some of that money went to Sheridan County.

31BB Your concern is understandable; however, the Montana Department of State Lands cannot deny a permit application solely on the basis of adverse social or economic impacts.

There are means to limit growth due to the energy development in Montana. Sheridan County could charge a uniform sewer and water fee (like the city of Sheridan) high enough to force newcomers into Big Horn County, Montana, where demand for services would be matched with the taxing authority to provide the services.

Director
U.S. Geological Survey
National Center
Mail Stop 108
Reston, Virginia 22092

Sir:

My copies of the Northern Powder River Basin Coal, Montana and the Proposed Mining and Reclamation Plan, Pearl Mine, Big Horn County, Montana draft environmental statements were received by me on September 10, 1979. This was 3 days past the published deadline for receipt of public comments. I am enclosing what I believe to be constructive comments on the adequacy of the Regional Analysis fully aware that the Agency may ignore them in production of the FFS.

Sincerely,



Robert A Taylor Jr
555 Battlecreek Rd
Apt F-9
Jonesboro, Georgia 30236

cc. Sen. Max Baucus (D-Mont)
Cong. Pat Williams (D-Mont)

LETTER 32

Regional Analysis

DFS Northern Powder River Basin Coal, MontanaGeneral Comment

32A The discussion of the present and future sociological conditions in the subject area raises many questions that are not satisfactorily addressed. This is particularly evident in the information provided on Native American residents of the area, in particular, members of the Crow and Northern Cheyenne Tribes of Indians.

The statement recognises the existence of the present Reservations and refers to the conservatism of the Indian's culture however it fails to discuss cultural restraints in relation to the various proposals on energy development which result in social impacts.

The influence of these Tribes, their culture and physical presence extend beyond the boundaries of their Reservations. Tribal members live off-Reservation. The Tribes control a significant percentage of the Nation's strip-mine coal resources. They have not plunged headlong into rapid exploitation of their energy resources. The financial rewards of such exploitation to Tribal members is obvious. It is quite probable that had the Crow been so inclined they would now be receiving royalties sufficient to raise per capita income above the National average. They and the Northern Cheyenne appear to be tolerating extremely high unemployment as an alternative preferable to exploiting their energy resources.

This should cause Federal Officials and Agency Planners to pause and reflect on the situation. They should insist on understanding why this is going on.

The statement contains passing reference to "----strong cultural traditions ----" and then does not pursue the subject. Changes in the sociological status quo regardless of magnitude or rapidity may result in conflict

32A Your analysis of the history and values of the Crow People is appreciated. The regional statement does not treat change as solely a problem for the native peoples.

General Comment--2

with their culture. The ramifications of this stress reach beyond Reservation boundaries and beyond individual members of the Tribes.

The sociological importance that these Tribes once had in the Region prior to 1880 is clearly returning. The simple fact that a special relationship exists between the Congress of the United States and the Crow and Northern Cheyenne Tribes (Semi-autonomous Nations within the boundaries of the United States) requires Federal Agencies to pay particular attention to their specific proposals and programs in relation to potential conflicts with the Tribal Cultures.

An understanding of the "Crow-Way" and its adequate discussion in this document should help to identify specific areas of conflict and provide reasonable mitigation. Failure to understand traditional concepts and cultural requirements known and practiced by Tribal members will most certainly result in additional stress on the individual Crow as well as the Crow Tribe. This stress has been and can be manifested is resistance to and additional burdens on other regional activities of non-Indians in the private, civil and federal sectors.

Every effort should be made to address and fully understand the Tribal cultures in this public document in order to prepare for the orderly development of the region's energy resources. There can be no doubt that exploitation of Northern Powder River Coal is going to have significant adverse sociological impacts. It is a question of recognizing these adverse impacts which can be mitigated and those that are unavoidable. The FTS should discuss the impacts resulting from existing energy developments within and adjacent to the Reservations and measures taken to mitigate them. It should discuss additional impacts recognized in and which will result from implementation of the alternative levels of production. The Federal Agency should develop, through cooperative association with appropriate Tribal Representatives, measures to mitigate where ever possible those impacts which are determined culturally unacceptable and include such mitigations in the FTS.

LETTER 32

3

Specific Comments**32B** J. Scope page I-1 2nd paragraph

The statement that the EIS "----does, however, consider any impacts the proposed developments would have on the Reservations" is misleading. The fact that there will be impacts on the Reservations is stated in the EIS but it does not specifically identify what these impacts are, why the impacts are expected, steps to be taken to mitigate for adverse impacts and what are unavoidable adverse impacts. Tribal members living off the Reservations, in the study area, should be considered also.

H. Social Environment**32C** a. Native American Period page II-77

This discussion does little to accurately inform the reviewer on chronology of event or participants. The area of concern is rich in cultural resources. An unbroken chronology of human occupation has been identified from the prehistoric to the present and many significant political and military events took place during the 19th century. The discussion should provide accurate information on the question of Crow occupancy of the Yellowstone and Bighorn Basins. This important feature is not presented. The remarkable efforts of the surviving members of the Northern Cheyenne to seek asylum in southeastern Montana is worthy of inclusion in the discussion. A more accurate presentation of historic and prehistoric information on the existing Indian Tribes in the area will illustrate their determination to exist as distinct peoples with their cultural association and traditional concepts of land and other resource use.

The chronology and outcome of the very important battles of 1876-77 between the U.S. Army and the Sioux and Cheyenne should be corrected.

March 17, 1876 Under Gen. George Crook's command Col. J.J. Reynolds attacked a village in the Powder River Valley. The troops burned the village and captured many of the horses but the Indians resistance was so intense that the Army had to withdraw. The Indians recaptured all

32B-K

These comments request a discussion of the Northern Cheyenne and Crow Indian Reservations in greater detail than is necessary for the purposes of this document. The social and economic conditions Mr. Taylor describes are not discussed in detail in the EIS because they would not be significantly changed by approval of the proposals under consideration.

of their horses.

32C June 17, 1876 After the Powder River fight in March Gen. Crook retreated from Montana to Fort Fetterman. As part of a three-pronged offensive he led a column northward to attack Sioux and Cheyenne in May. His column of about 1700 troops made contact, a pitched battle, with about 1500 Sioux and Cheyenne warriors, on Rosebud Creek. It was quite likely that Gen. Crook did not drive the Indians "off the field" but instead the Indians deliberately withdrew, hoping the Army would chase them thus allowing the Indians to initiate a favorite tactic--an ambush. Gen. Crook could not continue the fight--the opposition was too strong--so he withdrew instead of chasing the warriors, to his supply and base camp near Sheridan, Wyoming.

June 26, 1876 The Rosebud Creek Battle of June 17 prevented Gen. Crook from joining forces with the two columns coming from the north. They were not aware that Crook had withdrawn. Col. G.A. Custer's column attacked the large camp on the Little Bighorn and was rubbed out. This battle was the third, not the second, in the area that year.

Information on the Tribal homeland of the Crow should include: 1825--the first treaty of peace and unity was made with the Crow Tribe which was recognised as friendly (To the U.S.). 1851---Following the Fort Laramie Treaty, which marked out lands of several Indian groups on the basis of lands they were occupying at the time, a map drawn by Father DeSmet furnished the record and boundary of Crow lands of approximately 38.5 million acres. This area encompassed everything from the Musselshell River in Montana on the north, the Powder River on the east, the headwaters of the Powder and Bighorn Rivers on the south and the Rocky Mountains on the west. In effect most of northern Wyoming west of the Powder River and most of southeastern Montana south and east of the Musselshell River. An area equal to about 41% of the present state of Montana or 61% of the State of Wyoming. Almost the entire area encompassed in the Northern Powder River Basin Coal, Montana boundary was recognised by the United States as Crow land. However the United States insisted

LETTER 32

5

on a new treaty. In 1868 they lost approximately 74% of their lands and had to accept an area of approximately 8 million acres entirely within Montana. Subsequent political actions and pressures required the Crow to accept a smaller reservation upon which they now live.

32D d. Rapid Change and Uncertainty 1970-present page II-80

This section should address the dissatisfaction of leaders of both Tribes with coal leases negotiated for them by Federal Officials and subsequent legal and Tribal Council actions taken to protect vital Tribal interests. It should discuss Tribal concerns for their economic and cultural welfare which has contributed to the lower rate of coal production--lower than the rate anticipated by non-Indian planners.

32E 2. Population page II-80 fourth paragraph

This should also present data on numbers of Crow and Northern Cheyenne Indians living off-reservation in the effected counties.

32F 3. Social Environment page II-82 third paragraph

This section should also state that the influx of people as well as plans and programs not cognizant of the cultural conservatism of the Tribes has had adverse impacts on the Tribes. Tribal stresses reach beyond the boundaries of their reservations and effect non-Indian programs, plans, institutions and individuals.

a. Adverse Effects on Individuals page II-82

It is noted that discussion is presented on effects on ranchers and other groups. However there is no differentiation between Native Americans and non-Indians. This should be clearly defined in all discussions and data. Non-Indians are simply not subjected to the same cultural pressures as are the Crow and Northern Cheyenne Indians. We would assume that non-Indians in the area are primarily governed by their acceptance of a given set of non-Indian cultural beliefs, restraints and privileges. The local

Native Americans are however caught between the requirements of their own culture and that of the non-Indian. It cannot be expected that Crow and Cheyenne Indians will react to a given situation in the manner nor for the same reasons as a non-Indian.

It is noted in the second paragraph on page II-83 that the concept of "future shock" is presented in relation to the recent dilemma of the local ranchers. The concept of future shock should most definitely be addressed in relation to the culture and lives of the Crow and Northern Cheyenne Indians and their methods of coping with the phenomenon. This concept, when understood and applied to the Native American community under consideration will provide guidance in determining potential effects and mitigations for those found adverse.

b. Benefits to individuals page II-84 second paragraph

This section should provide information on exactly what segments of the population has not shared benefits and the reasons for this.

fifth paragraph

This section should include data on percentage of the construction forces which are members of either the Crow or Northern Cheyenne Tribes.

32G I. Employment page II-85 second paragraph

This section should discuss the culturally acceptable practice of agricultural employment among the Native American community in relation to mining and construction which while increasing in importance apparently does not offer the Native Americans the same opportunity.

32H Table II-20, II-21, II-22 pp II-86-88

These tables should present data on numbers of Native Americans represented in the various industries and sectors.

32I C. Unemployment page II-90

This section should address and present data pertaining to the income of

LETTER 32

7

the Crow Tribe and various per-capita disbursements of funds to Tribal members. It is possible to unemployed yet be receiving income. These data should give federal officials concern. It would appear as if the Crow and Northern Cheyenne Tribes have accepted unemployment as an acceptable alternative to rapid exploitation of their energy resources. This would indicate powerful incentives persist in their cultures to maintain their unique identities which in turn makes cultural and social conflicts very probable.

32J Income page II-92 fifth paragraph

This section should present data differentiating between Indians and non-Indians in relation to residence by county and whether they live on or off the reservations. The discussion as presented is not clear because of the bi-cultural aspect of the Region's population.

32K d. Trade and Capital Flow on the Reservations page II-102 first paragraph

A singular problem, seldom addressed by non-Indians in their planning of programs, specific plans, specific actions etc., which require involvement of the Crow Tribe of Indians, is the failure to make a determined effort to understand the "Crow-Way", the culture of the Indians and how this culture permeates their lives. It is a successful culture and quite alive. It is not however cast in concrete. It, just as other cultures, changes with time. Some aspects change more rapidly than others, some aspects are infinitely more important than others. In some areas it is quite flexible and allows individuals a great deal of freedom of choice. It is important to identify those cultural aspects which would be effected by the proposed actions.

It is very important that this understanding be guided by cooperation from within the Crow Tribe for the "Crow-Way" is still a verbal culture. Too often reliance on written descriptions will not produce the desired understanding. It is possible, with proper contact within the Tribe and respect for what is being done, to determine if indeed there are cultural avenues upon which to proceed, cultural requirements that can support whatever is planned or if modifications can be made in whatever is being planned to meet certain cultural requirements.

O. Esthetics page II-126

32L The ranking of landscapes in the area may be too severe. It is a subjective evaluation. The statement should consider the opinion of a Crow leader of the mid 19th century which in part illustrates the passionate fondness they have for their lands:

"The Crow country is a good country. The Great Spirit has put it exactly in the right place; while you are in it you fare well; whenever you go out of it, whichever way you may travel you fare worse. If you go to the south, you have to wander over great barren plains; the water is warm and bad and you meet with fever and ague.

The Crow Country is exactly in the right place. Everything good is to be found there. There is no country like the Crow country".

In early August 1866 the United States Army sent a column north from the newly selected site for Fort Phillip Kearney located southwest of Sheridan, Wyoming. The column was to proceed north and establish a new fort, Fort C.F. Smith at the mouth of Bighorn Canyon, on the Bighorn River. Lieutenant George M. Templeton wrote in his diary August 5, 1866--"Marched early, and camped at Goose Creek. We are beginning to come into the country talked of so long--the finest country in the world--It would be better if there were more timber,---The grass is very fine.---I saw some fine scenery".

Entry--August 6, 1866 "Marched at 5:30 A.M. and camped on Tongue River, crossed one fork 2 miles before coming to camp. The water is very clear. The men caught quite a number of the finest fish, some of them trout, that would weigh two or three pounds. The country is improving every day. This is a fine valley and then the scenery is magnificent"

32L There are many ways of rating esthetic quality; for the method used in this EIS, see response 30Q.

LETTER 32

9

Planning and Environmental Controls page III-1

32M This section should address requirements of Public Law 95-341, the Native American Religious Freedom Act.

32N Wildlife G. page IV-38

This section should address the impacts of illegal killing--poaching of wildlife. It can be expected that such activity will have a significant effect on the local game populations. Game laws in relation to Indians on their Reservations should be addressed. Members of the Crow Tribe are not restricted from year-round hunting or by bag-limits on their Reservation. It can be expected that among the influx of new residents in the Region there will be those individuals who cannot resist shooting at large raptors thus some eagles will be illegally killed.

2. Social Environment page IV-46

32O This section should address resistance to cultural change by the Native Americans in the area. There will be more change off-Reservation than on-Reservation. It should also address the fact that this resistance can be manifested in greater adherence to Tribal-ways (culture) by increasing numbers of people.

a. Adverse effects on individuals page IV-46

This section should be expanded to include discussion on Native Americans.

32M-Q These comments request a discussion of the Northern Cheyenne and Crow Indian Reservations in greater detail than is necessary for the purposes of this document. The social and economic conditions Mr. Taylor describes are not discussed in detail in the EIS because they would not be significantly changed by approval of the proposals under consideration.

I. Employment page IV-51 first paragraph

32P This section should be expanded to include discussion on why Native Americans in the area will benefit little by expansion of mining activities.

6. Reservation Economics page IV-56

32Q This section should be expanded to include information on why the Native American residents on the Reservations will benefit little from the proposed developments.

N. Cultural Resources page IV-70

32R This section should be expand discussion on impacts of "pot-hunting". The monetary value of genuine historic and prehistoric artifacts guarantees the expansion of such illegal activities on federal lands. "pot-hunting" in this region is not an "occasional" occurrence.

Unavoidable Adverse Impacts page V-1 third paragraph

32S This section should be expanded to include discussion on illegal hunting --poaching on game species as well as on Golden and Bald Eagles.

Page V-1 fourth paragraph

32T This section should make note that additional stress on the cultural fabric of the Crow Tribe will result in increasing difficulties for other Federal Agency programs and for various Regional Service Agencies.

Irreversible and Irretrievable Commitment of Resources page VII-1

32U This section should be expanded to discuss cultural (Indian) loss resulting from the effects of the mining activities.

32R Pot-hunting is not a major problem in the region at this time. The subject is adequately covered in chapters III and IV of volume I.

32S There would likely be some poaching of game and nongame animals. How often it would occur cannot be foreseen. Illegal taking of game and nongame animals has increased since mining resumed in the region. As population continues to increase, illegal kills would increase but would probably not become worse than in other areas of the State (Larry Lockard, U.S. Fish and Wildlife Service, oral commun., 1979).

32T-V These comments request a discussion of the Northern Cheyenne and Crow Indian Reservations in greater detail than is necessary for the purposes of this document. The social and economic conditions Mr. Taylor describes are not discussed in detail in the EIS because they would not be significantly changed by approval of the proposals under consideration.

Tri-County Ranchers Association

Birney, Montana 59012
August 29, 1979

Director, United States Geological Survey
108 National Center
Reston, VA 22092

The Tri-County Ranchers Association would like to submit these comments regarding the DRAFT ENVIRONMENTAL STATEMENT, REGIONAL ANALYSIS, NORTHERN BIG SKY RIVER BASIN COAL, MONTANA.

33A In the Summary of this analysis the statement that there would be a "temporary" reduction in grazing land and land uses would be only "temporarily displaced" assumes that successful reclamation will take place. However, throughout the analysis reclamation is not assured...II-63. IV-28. IV-30, VIII-16 and more. We also disagree with the assumption that "other lands throughout the study area" are "abundantly available" for those temporarily displaced land uses.

33B What, or whose, standards determine whether the region "has few esthetically distinctive areas"?

33C On page II-62 is a statement concerning the salvageable "topsoil" depth of an average of 50 inches in the area of the Big Sky Mine. Even if the term "topsoil" has no exact meaning, 50 inches of soil suitable for supporting plant growth is a lot for southeastern Montana.

33D This draft statement gives only cursory attention to the proposed Decker North Extension Coal Lease Application. Yet, the final application excused itself from preparing an Environmental Impact Statement because; "the tract has recently been included in an EIS prepared by U.S. Geological Survey and the State of Montana". (the NPREIS)

33E Adverse impacts and conditions regarding wildlife, air quality, communities, hydrology and reclamation are all duly noted. Nevertheless, the impression received from this EIS is that the impacts are considered insignificant...especially on a regional basis. For instance, the loss of springs or water wells

33A The statement that there would be a temporary reduction in grazing land refers to the complete exclusion of livestock grazing and wildlife use during and immediately after mining. Although reclamation to meet legal standard is not a certainty it is our best guess, based on available data, that the reclaimed minesites would support livestock in numbers comparable or slightly less than was possible before mining under optimum conditions.

The science of reclamation in the northern Great Plains is still very young. The possibility of reclamation failures cannot and should not be ignored; however, we are not predicting such failures.

33B See responses 30Q and 32L.

33C The topsoil referred to in this section includes a considerable volume of material which is somewhat affected by soil-forming processes ("C" horizon), and which is chemically acceptable and texturally marginal (sandy). Although the soil is adequate as a reclamation resource, the overall quality of the soil would be maximized by selecting the best 28-30 inches. FES 79-46 on the Big Sky mine contains a detailed discussion of these soils.

33D The reference is to FES 77-20 on the Decker mine, which was prepared by the Montana Department of State Lands and the U.S. Department of the Interior.

33E,F See response 30V.

Although not a decision document itself, this regional statement will presumably be a source document for decisions on future mine plan applications. The information in the statement will be updated as necessary before incorporation into detailed site-specific EIS's.

Comments: Tri-County Ranchers Association
DRAFT ENVIRONMENTAL STATEMENT, REGIONAL ANALYSIS
NORTHERN POWDER RIVER BASIN COAL, MONTANA
August 29, 1979
page 2

is treated lightly on page IV-6 with the statement: "But the mining companies would be legally required to replace degraded supplies".

33F

The constant use of terms such as; "would most probably", "assumed", "appear to be", "relative to", "it is very possible" and others similar throughout the draft points to uncertainty and a background which lacks sufficient scientific data. The section on hydrology on IV-5 is much too important to be written with such ambiguity: "mines would use little water relative to what would be available for other anticipated uses, and they would probably not cause enough degradation to interfere with other uses. Total demand...would probably nowhere exceed available supply. Impacts on availability and quality of water would probably be temporary..." The least professional statement has to be; "a best guess is that they would be slight" on page IV-6 where reference is made to dissolved solids and sedimentation. More attention and research should be given to the subjects of reclamation and hydrology.

The final regional analysis will "most probably" be used as a basis for future decisions concerning developments in the region. We think that a better environmental statement must be written.



Mary Daniels, President
Tri-County Ranchers Assoc.

LETTER 34

David Weber
Air Pollution Research
Box 382
Porsyth, Montana 59327
406-356-7207

Director
U.S. Geological Survey
108 National Center
Reston, Virginia 22092

34A The Draft Environmental Statement for the Northern Powder River

Basin Coal, Montana contains statements attributable to myself which are in error. On page II-43 of the document in the third paragraph the units on the sulfur values are confused and mileage values are inexact. The paragraph should read as follows:

During plume strikes 7.3 miles downwind of Colstrip units 1 and 2, mean hourly SO₂ concentrations average about 11.6 ug/m³ (.005ppm); Maximum hourly SO₂ concentrations have been 115 ug/m³ (.050ppm) at 2.6 miles and 42 ug/m³ (.018ppm) at 7.3 miles-----

34B The conversion between micrograms per cubic meter and parts per million is based on the Colstrip average ambient pressure of 670mmHg. The reference should not list me as employed by the U.S. EPA since at the time of the communication I was no longer associated with that agency. I was under contract to Battelle Pacific Northwest Laboratories doing ambient air monitoring in the Colstrip area. More comprehensive information on ground measured emissions of Colstrip units I and II is currently available by contacting me at the above address.

34A Your correction is noted.

34B In the footnote on page II-43, change "EPA" to "representing Battelle Pacific Northwest Laboratories."

David B. Weber

WESTERN ENERGY COMPANY

40 EAST BROADWAY / BUTTE, MONTANA 59701 / (406) 723-5421



September 4, 1979

Director, U.S. Geological Survey
National Center
Mail Stop 108
Reston, VA 22092

Dear Sir:

Western Energy Company submits the enclosed comments on the draft environmental statement for the Northern Powder River Basin. Also attached are comments prepared by C. F. Cole and G. J. Fletcher of TRC, environmental consultants, on behalf of Western Energy.

35A It was very disturbing to note that the EIS did not include any portions of the Rosebud Mine in the site-specific analyses. For the past two and one-half years, Western Energy Company has been submitting detailed information concerning mine plans for areas of the Rosebud Mine at Colstrip to state and federal agencies upon their request. It was Western's understanding that these plans would be incorporated into the EIS as site-specific considerations. The omission of this material from the EIS may result in further delays in federal approval of mining plans, acquisition of short term leases and obtaining mining permits from state and federal agencies.

Western Energy Company strongly objects to the numerous unqualified statements of fact in the EIS which were liberally made without citations of source material. Such conjectures or speculations are unprofessional and must be disregarded.

We appreciate the opportunity to comment and we urge you to give full consideration to these comments in the preparation of the final EIS.

Sincerely,

Dennis J. Schwehr
Dennis J. Schwehr
Environmental Coordinator

DJS/mp

Enclosures

cc: Glenn Malmberg, U.S.G.S.
Michael Wilson, Mt. Dept. of State Lands

35A The information provided by WECO was used in the cumulative analysis of coal development in the Colstrip area. No site-specific EIS's on the Rosebud mine have been issued as part of this regional statement because no mining permit applications requiring an EIS had been made.

This regional statement will be used as a reference in the forthcoming site-specific EIS on Western Energy's Area B mine expansion. The information in the regional statement will be updated and corrected as necessary in the site-specific EIS.

This environmental statement was prepared by an interdisciplinary team with expertise in the fields reviewed. Where published scientific data on an important issue were lacking or were inconclusive, team members made projections based on their best professional judgement. Statements on such issues are qualified as necessary through use of terms such as "would probably," "possibly," etc., to reflect the scientific uncertainty.

LETTER 35

Western Energy Company's Comments on the
Draft Environmental Statement

Northern Powder River Basin Coal, Montana

I-1

The EIS discusses a 7500 square mile designated region and also adjacent areas.

35B Comment: Adjacent areas should either be excluded from EIS or be included within the designated study area.

I-6 "Northern Energy Resources Company....proposes a new mine at Spring Creek..."

35C Comment: The use of the present tense is confusing because Spring Creek Coal Company has been granted the necessary mining permits.

I-42

35D Tables II - 11 and 12 do not provide source information. Are the emissions data for Colstrip as shown in Table II - 12 representative of the town site excluding emissions from generating units and the mines and if so how was the determination made?

II-7

35E Reference is made to Table III-5. This should read Table III-4.

II-12

"...Four large strip mines were producing coal in southeastern Montana...(Table II-1)"

35F Comment: The Big Horn Coal Company Mine should not be included in the table as it is located in Wyoming.

II-13

"The proposed Big Sky Expansion and Colstrip Generating Units are on tributaries of Rosebud Creek."

35G Comment: The proposed Colstrip generating units are on the East Fork of Armeil's Creek which drains directly to the Yellowstone River and is not part of the Rosebud drainage.

II-13

"On going mines are the largest users of groundwater in the area."

35H Comment: This statement needs further explanation, such as how water is used or consumed by the mining operations and in what quantities.

35B See responses 20A and 23A and chapter IX, Clarification of Scope and Purpose. The designated region was established by the Secretary of the Interior to identify current coal development proposals requiring a regional analysis. Because the impacts of those proposals in some cases would extend beyond the boundary of the designated region, it was necessary to examine adjacent areas as well.

35C See response 29A.

35D The tables are based on emission factors found in U.S. EPA (1976a). Table II-12 shows emissions based on resident populations and does not include the mines and generating units.

35E Correction noted.

35F Add "(Wyoming)" after "Big Horn Coal Co." in table II-1 on page II-12.

35G Correction noted.

35H Add to paragraph: "Current use by all existing mines in the area for sanitary purposes, dust control, equipment washing, etc., totals about 500 acre-feet/year."

II-35 and 36

"...Colstrip has been classified as nonattainment for TSP."

35J Comment: This designation was a result of TSP data collected from Hi Volume samplers that do not meet the criteria put forth by the U.S. Environmental Protection Agency in Ambient Monitoring Guidelines for Prevention of Significant Deterioration (PSD). In addition, the excesses were largely a result of temporary construction activities near the sampler.

II-36

In Table II - 10, TSP annual geometric means and maximum 24 hour averages from selected (emphasis added) sampling sites in the region (1977 data) are shown.

35J Comment: WECO #4 and WECO #2 are two of the six hi-vol sites established by Western Energy Company at the request of the Department of State Lands and the Air Quality Bureau. Five of the six sites including #2 and #4 were located within Western's mine area and next to active mining operations at the direction of Mr. David Maughan of the Air Quality Bureau. The purpose of locating hi-vol #1, #2, #3, #4 and #6 near active operations was to monitor those specific operations for emissions and not for compliance determinations. The data for these five sites should not be used for any determination of air quality because they were not located in accordance with the criteria set forth by the US Environmental Protection Agency in "Ambient Guidelines for Prevention of Significant Deterioration". It should also be noted that the Colstrip Site, MPCo. Site #3, does not meet a single one of the five factors specified in the EPA criteria for TSP monitoring.

II-37

"Colstrip has a serious fugitive dust problem ..."

35K Comment: Again, the source of such a statement is the data from sites not designed to be used for such determinations in the case of Western Energy's sites #1 through #6 and from MPCo. Site #3 which does not mean any of the EPA siting criteria. Why isn't any of the data from MPCo.'s other three sites quoted or used for determining attainment? These three sites have continually shown compliance readings and are representative of the Colstrip area. Their site locations also meet EPA criteria.

II-37

The statement was made that most of the Colstrip fugitive dust comes from the Rosebud mines (PEDCo, 1978), notably from unprotected coal handling facilities and from uncovered coal piles.

35L Comment: This statement is erroneous. No implication or statement was made in either the PEDCo 1977 or 1978 reports

35J The U.S. Environmental Protection Agency designated the Colstrip nonattainment area for TSP based on the records of one high volume sampler in the town of Colstrip. Notice of the designation was given in the Federal Register, March 3, 1978. The boundaries of the nonattainment area are somewhat arbitrary; nevertheless, TSP levels within the designated area must be in compliance by the end of 1982 so long as the designation stands.

35J Table II-10 states that the site type for WECO No. 2 and No. 4 is industrial. We do not feel the data should be excluded from the FES. Monitors within the mine boundary do not necessarily show ambient air quality and do not provide information about air quality downwind of the minesite.

35K "Serious" is used with respect to violation of the annual and 24-hour TSP standards. The violations occurred in Colstrip, not at WECO's TSP sites.

35L The reference should be PEDCo (1977). The PEDCo (1977) report states on page 3-33: "The conclusions of a qualitative analysis indicate that surface coal mines are the major particulate sources in the Colstrip area and will continue to be so through 1985." The conclusion that the coal handling facilities are an important source of the Rosebud mine's particulates is our own.

It is true that the coal handling facilities may contribute relatively little particulate by weight. The contribution of the coal handling facilities is important because coal dust may be more harmful to plants and animals than silica dust and because it is possible to greatly reduce emissions from the handling facilities. See response 30G.

to this effect. The PEDCO 1978 report includes a site specific survey at the Rosebud Mine which revealed that dust emissions from coal handling facilities and coal piles contributed a relatively minor portion of the total emissions from the mine area.

II-37

"The strip mines and particularly the coal handling facilities, not the town, are the major sources of particulates." (PEDCO 1978)."

- 35M Comment: The statement is false and did not appear in the PEDCO 1978 report. Again, emission factors developed by PEDCO shows that the coal handling facilities are not the major dust source at the mine.

II-37

Aerial photographs of the Rosebud Mine, the Big Sky Mine and the Absaloka Mine show dust fall on freshly fallen snow. The EIS states that much more dust appears on the ground at the Rosebud Mine than at the other two mines.

- 35N Comment: It must be noted that the production at the Rosebud Mine is more than twice that of the Absaloka Mine and more than five times that of the Big Sky Mine. In addition conclusions can not be drawn from these photographs as each exposure was taken from a different distance.

II-40

- 35O When discussing air pollution and coal dust from unit trains reference is made to Tables IV-5 and IV-6. The source of data is not provided.

II-45

"The air quality of the six county study area is generally excellent except for local fugitive dust and gaseous emissions from strip mines and the plume from Colstrip Units #1 and #2".

- 35P Comment: The statement is not cited. The statement indicates that the emissions of Colstrip are greater than emissions from surrounding counties. This is a contradiction to the information provided in Table II - 12 which shows that emissions in Forsyth, Hardin and Sheridan are equal to or exceed those of Colstrip. The table deserves further explanation.

II-75

"...ring necked pheasant would be more affected by mining around Colstrip."

- 35Q Comment: Statement is not true. ECON (1978) reported only two observations of pheasants near mine area C which is the only mine area which has the potential to effect riparian

35M See response 35L.

35N

The Rosebud Area A loadout handled about 6 million tons of coal in 1978, about the same as the Absaloka mine. The photographic comparisons, although imprecise, show that covered coal handling facilities reduce fugitive dust.

35O

The source of data for table IV-6 is URS (1976); for table IV-5, Paulson and others (1976) and Nimerick and Laflin (1977).

35P

The statement on page II-35 was taken out of context. It was a lead sentence for the air quality section describing in general terms the ambient air quality of the area. More descriptive material followed.

35Q

The statement on page II-75 on ring-necked pheasant is deleted.

habitat along Armell's Creek. Riparian habitat along this portion of the creek is either nonexistent or poorly developed.

II-75

35R The EIS states that the 33 sharp-tailed grouse leks have been located in the Colstrip area. This figure is somewhat misleading as not all leks are presently active. Many have been abandoned in past years and others have been created.

II-75

"The east fork also has a minor fishery."

35S Comment: The statement was not cited. This is true only near the mouth of the creek where flow is permanent. Three years of research by Western Energy on the upper portions of East Fork have revealed no fish observations above Colstrip and only fathead minnows were found below Colstrip.

II-78 and 79

"Although mining began in Colstrip in 1924 it did not begin large scale coal production until the late 1960's..."

35T

Comment: This is misleading as production at Colstrip in 1943 exceeded 2.5 million tons and was the largest producer in the state (Thomas Morgan, First Montana Coal Resource Symposium, 1966). From 1924 to 1958 more than 44,000,000 tons of coal had been mined in the Colstrip area. Coal production in 1968 was 150,000 tons and in 1969 was 521,000 tons.

II-79

"Oil production was the primary new economic activity causing a population increase in Powder River and Sheridan Counties in the 1950's."

35U

Comment: Statement is erroneous. Table II-19 shows that populations declined in both counties in the period of 1950 to 1960.

II-80

"Colstrip and Forsyth are approaching boom-town growth (population growth too rapid to manage)." The EIS implies that rapid growth in the Colstrip area has resulted in social detriments.

35V

Comment: The community of Colstrip has received two national awards. In September 1978 The Denver Federal Executive Board presented Western Energy Company an award for socio-economic improvement for outstanding achievement in the field of energy and environment. In addition, in January 1979 Colstrip was presented with the grand award in the "Sensible Growth Design and Planning" competition sponsored by the National Association of Home Builders and Better Homes and Garden magazine.

35R Noted.

35S The statement on page II-75 should read: "The east fork also has a minor fishery in the perennial reach near its mouth."

35T

The sentence is revised--insert on page II-78, 79: "Mining began at Colstrip in 1924, and although it reached a peak production rate of nearly 2.6 million tons in 1943, it had relatively little effect on the primarily agricultural society."

35U

The last sentence of the first paragraph in section c on page II-79 is deleted.

35V

Colstrip is not a typical energy growth community. Though the awards were deserved, many individuals and groups in or near Colstrip have suffered in spite of the attempts at growth management. Some may have avoided social costs they otherwise would have experienced; others many have suffered less because of the efforts of Montana Power and Western Energy Companies. Rapid growth in Colstrip has created and will continue to create management problems in spite of the best efforts to manage the growth.

II-82

The EIS states that growing urbanization has contributed to local feelings of alienation and a loss of a sense of community. This is most apparent in Colstrip where premining residents found that their community no longer seemed to belong to them.

35W

Comment: The town of Colstrip was born as a result of coal mining in 1924; therefore, there were no premining Colstrip residents. During the period when the mines were shut down the townspeople consisted primarily of a few school teachers and retired people. Local area ranchers used the town primarily for school and postal facilities. Commercial services were limited to a small soda fountain.

II-82

"Growth has not been orderly, controlled, or well-planned for,... rapid growth due to mining and coal conversion projects has not sufficiently developed community resources nor has it equitably distributed those resources."

35X

Comment: This statement is not true as applied to Colstrip. As mentioned previously, Colstrip has received awards for a sensible well-planned community.

II-82

The EIS states that between 1970 and 1977 Powder River and Big Horn Counties had net out-migration.

35Y

Comment: Table II-19 shows that both counties had population increases during the period of 1970-1976.

II-83

"Local merchants have shifted from catering to the needs of ranchers to the needs of the new mining and construction related population."

35Z

Comment: This statement is misleading in that it applies that ranchers are unable to receive commercial services as before, but in fact more services are now available.

II-83

"County commissioners and town governments have been preoccupied with coal related activities, thus neglecting the needs of their ranching constituents."

35AA

Comment: No citation is provided for this statement. The three present commissioners for Rosebud County are or were ranchers. This does not deviate from the historical pattern.

II-109

"Colstrip and Ashland have excess water and sewer capacities which are somewhat of a financial burden."

35U

The term "premining" as applied to Colstrip is incorrect. The discussion on page II-82 refers to people who lived in Colstrip before 1968. The feelings of alienation noted by Gold were caused by a new kind and rate of growth, not by mining per se.

35V

The statement on page II-82 referred to the uneven distribution of benefits and costs from development. Social, psychological, and financial problems will likely occur in rapid-growth communities despite the best possible design of structures, streets, and facilities.

35W

Net outmigration means that more people move out of an area than move in. Big Horn and Powder River Counties grew, despite net outmigration, because many more people were born than died there.

35X

The statement on page II-83 means that ranchers are no longer able to derive their former satisfaction in the exchange of goods and services. The value of the exchange as a social event has declined even though the variety of goods offered may have increased.

35AA

The statement is supported by Gold (1974b), who found that the county commissioners, though ranchers, were preoccupied with coal-related problems and could no longer devote most of their attention to ranching-related problems.

- 358B** Comment: There is no financial burden on the citizens or taxpayers of Colstrip, because the facilities were paid for by private funds and coal board monies. Capacities are in excess of present needs, but were wisely designed to accommodate future growth in Colstrip.
- II-127**
The EIS states that even if the proposed mines and generating units were not approved that by 1990 violations of air quality standards for TSP and dustfall are expected to become more frequent in the Colstrip nonattainment area.
- 35CC** Comment: The Federal Clean Air Act requires that all non-attainment areas be reclassified as attainment by 1982. Concentrations in excess of air quality standards will no longer be permitted. Control measures will be implemented to reduce emissions.
- II-128**
The statement is made that coal from Area C will be burned in Units #1 and #2 after about 1982.
- 35DD** Comment: This statement is not true. Coal to be burned in Units #1 and #2 is anticipated to come from Areas E and D. For this reason the SO₂ emissions described in the EIS are inappropriate.
- II-128**
The EIS also states that Area C coal is lower in BTU content and higher in percent of sulfur than coal from Area E and references the Yellowstone River Basin Draft Environmental Impact Statement for Water Reservation Applications, 1976, by the Montana Department of Natural Resources and Conservation.
- 35EE** Comment: The Yellowstone River EIS does not discuss BTU content or sulfur in Colstrip coal.
- II-128**
"The number of elderly will increase more slowly than the rest of the population because towns, such as Sheridan, will become less attractive as retirement centers".
- 35FF** Comment: This statement is speculative. It is true that the number of elderly will increase more slowly than the rest of the population, primarily because of the energy development around such towns as Sheridan will bring in younger people taking advantage of the well paying jobs, both permanent and temporary. Furthermore, such areas could be a favorable place for retired people to settle because of the lower taxation on private property. The Colstrip area is a good example of the taxation offset that industry can provide. The mill levy in 1968 was 143 and in 1978 it was 98. This represents a 31 percent decrease in taxation because of the increased property values of industry.
- 35BB** Colstrip residents have not had to directly pay all costs for the sewer and water systems. Although future growth may justify the current excess capacity, the systems are still more expensive to operate because they are not as efficient and because their high capital costs must be amortized.
- 35CC** The statement on page II-127 is a projection based on current conditions and does not assume any new controls. Control measures will no doubt be required to reduce emissions by 1990.
- 35DD** At the time of analysis, Area C was expected to provide coal for units 1 and 2. Your updated information is appreciated. The projections of SO₂ emissions from the units is therefore out of date. (See comment 36C.)
- 35EE** The reference is changed to Montana Department of Natural Resources and Conservation (1974), which discusses Colstrip generating units 3 and 4.
- 35FF** The comment is accurate. The number of elderly people may increase while their proportion to the total population decreases, owing to the influx of young workers and their families.
- The advantages of lower taxation would be more than offset (for most older people) by the disadvantages of living in a rapid growth area. See response 31S.

II-129

"Revenues in Rosebud County will probably decrease from 1978 to 1982 because of depreciation of Colstrip Units #1 and #2 and local decreases in coal production lowering taxable value..."

35GG

Comment: Tax revenues generated from Units #1 and #2 will actually increase in the near future as the present tax break enjoyed by Puget Sound Power and Light will cease. The statement that decreases in coal production will occur during 1978 to 1982 is true only if regulatory delays occur. Increases in coal production are anticipated. Increased production and the addition of more equipment will substantially increase the tax base.

IV-2 to IV-5

35HH

The draft references impacts to the area following mining and during mining. Considerable discussion relates to erosion on and off of the mine area and more specifically to drainages that run through the proposed mine areas. The draft fails in this area to point out the fact that the various state and federal reclamation laws require that all silts be held on the mine area settling ponds and that no water is allowed to the permit area without first being treated. Treatment of the water leaving the mine area is a responsibility of each operator until such a time the regulatory agency determines that the operator has achieved an adequate vegetative cover on the mine area and the bond is released.

IV-4

"Several existing and projected mine sites are clustered along Armells Creek at Colstrip...if gullying occurs in Armells Creek, either naturally or caused by the deposition of excess sediment from severe erosion problems on one of the mine areas, it would spread upstream, possibly initiating erosion problems on other reclaimed mine sites."

35II

Comment: This paragraph contains highly speculative statements. Only Area C has the potential to directly affect the creek. Excessive sediment is not permitted to enter the stream and severe erosion from mined areas will be prevented by the establishment of settling ponds as required by law. Existing regulations governing mining operations require that waters released from settling ponds contain sediment loads that are less than the loads naturally present in normal runoff. This has the result of increasing the potential of channel incision as the stream regains the sediment load.

IV-4

The EIS states that after reclamation under any surface mine plan in the region, reclamation surfaces would generally have higher erosion rates than the premining surface because of the increased surface runoff resulting from decreased infiltration rates.

35GG

The increase in tax revenues from units 1 and 2 would be more than offset by the loss of the severance tax rebate. Production increases at Western Energy would occur after 1982; increases at the Peabody mine are part of the proposals considered in chapter IV. The fiscal analysis in chapter II projects a decrease in constant-dollar taxable value between 1978 and 1982, which would result in either a decrease in real revenue or an increase in the local tax rate.

35HH

Your comment is noted. State and Federal requirements are summarized in chapter III.

35II

The discussion on page IV-4 refers to possible upstream erosion, which settling ponds would not prevent. The discussion calls attention to a potential problem.

35JJ Comment: This statement ignores the fact that chemical and physical composition of soils is not the same in all mines. In addition, current mining regulations require that reclamation practices such as ripping, on the contour, proper seed bed preparation and mulching be implemented to prevent erosion and increase infiltration rates. Implementation of these practices has proven to be successful at the Rosebud Mine.

IV-30

35KK The draft discusses the reclamation potential of the Colstrip area in paragraph three of this page. Reference is made to what is known as Cape Oliver and the diverse vegetative cover that has developed on this site over the last 50 years. The author goes on to state that other old spoils at Colstrip shows vegetation still in initial stages of succession with minimal chances of withstanding drought or sustaining intense grazing. He qualifies this with some reasons as to why these other spoils have not developed the degree of diversity that the Cape Oliver site has. One point that the author has failed to make in his discussion is the fact that Cape Oliver and a couple other smaller sites probably unknown to the writers of this draft were basically leveled during the deposition of the spoils material during the earlier mining.

As a result, the leveler areas, even though they are void of topsoil, fertilizer and man's reseeding efforts, have established fairly good vegetative cover. This in itself is an indicator of the reclamation capabilities of the area.

IV-33

35LL The draft discussed vegetative establishment and productivity. The last sentence in the first paragraph under this section states present technology has failed to demonstrate ability to permanently reestablish ponderosa pine, rocky mountain juniper, deciduous trees and many shrubs and forbs. This statement as it stands is somewhat misleading in that present technology has not failed to demonstrate an ability to permanently reestablish certain trees and shrubs. The fact is that present technology has not been directed towards that goal until the last two and one half years. The author should reevaluate gains that have been made through the use of tree spades and tubing transplants in reestablishing these species mentioned by the authors. In the following paragraph the author goes on to make assumptions as stated: "Over the long term live stock carrying capacity would probably be slightly below premining potential under management." This statement can only be considered an assumption on behalf of the author. Figure IV-10 which is referenced in the statement makes a comparison of a number of different parameters scattered through southeastern Montana. The productivity observed by DePuit and others (1978) was a result of livestock grazing on reclaimed spoils which were

35JJ Some increase in erosion on reclaimed minesites is unavoidable even with the mitigating measures listed in the comment.

35KK The purpose of the discussion on page IV-30 was not to discuss the reclamation capabilities at Colstrip but, instead, to show the difficulty of determining what affects reclamation success.

The situation at Cape Oliver is discussed in detail by Sindelar and Plantenberg (1978, 1979), who studied and compared five sites leveled in 1928 and one site leveled in 1930. The five 1928 sites--referred to on page IV-30 as "other old spoils at Colstrip"--were similar in topography and texture (sandy loam) but varied in species dominance and successional development. In this case, leveling did not appear to cause the difference in successional rates--other variables, poorly understood, were at work. Sindelar and Plantenberg (1979) state that a major source of difference in successional rates is soil texture (positively correlated with percentages of silt and clay), but where soil texture does not vary, other influences dominate.

35LL Proper choice of the species used in reclamation is necessary, but it does not assure long-term success.

The statements in volume I on livestock carrying capacity referred to premining potential under proper management, not to the actual level of use.

LETTER 35

primarily covered with introduced species. The total concept of this assumption is one that is not relevant to the reclamation requirements that now regulate mining.

IV-33

"The approximately 23,000 acres of land that would be disturbed by 1990 by all mining related development would not support vegetation comparable in overall quality to premining conditions for decades after reclamation."

35MM

Comment: The sources of the figure of 23,000 acres is not provided nor is the statement source. Does mining related development include railroads, power plants, townships, etc.? If so then not all of the 23,000 acres would be mined or reclaimed. In addition, not all of the 23,000 acres (if this figure is correct) consisted of undisturbed natural range conditions prior to mining.

IV-38

"Loss of wildlife habitat ... would last decades and possibly centuries."

35NN

Comment: No citation is provided. There is no evidence to support the statement. As discussed above, wildlife has not been impacted at Colstrip thus far and in fact sharp-tailed grouse and mule deer giving birth have taken advantage of the cover provided in reclaimed areas. In effect reclaimed areas are capable of providing habitat needs that are sometimes insufficient on surrounding undisturbed areas. This statement also assumes that reclamation research is at a standstill and will provide no further knowledge in improving the ability to reclaim successfully.

IV-60

Table IV-16 for Rosebud County states "all sewer and water systems would need expansion."

3500

Comment: This is a direct contradiction with the statement on Page II-109 which states that Colstrip has excess water and sewer capacities.

35MM The 23,000 acres of mining related disturbance includes rights-of-way, facilities, residential, and other disturbances associated with mining. About 16,000 acres would be mined. The figures are based on disturbances to date plus projections using company-supplied information.

35NN

Successful reclamation of ponderosa pine and sagebrush, both important to many wildlife species, has not been demonstrated in the region, and is by no means assured despite recent research.

3500

The statements are not contradictory. Although the systems currently have excess capacity, they would still have to be expanded to meet the projected doubling of connections and daily throughput.

CRITICAL REVIEW OF DRAFT
ENVIRONMENTAL STATEMENT:
NORTHERN POWDER RIVER
BASIN COAL, MONTANA

TRC

TRC — DENVER

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LETTER 35

1.0 INTRODUCTION

This report is a critical review of the portions of the Draft Environmental Statement: Northern Powder River Basin Coal, Montana (1) that discuss the air quality in the vicinity of Colstrip, Montana.

It is important that this critical review be put into proper perspective so that the comments, criticisms, and suggestions contained herein will be correctly interpreted. The authors recognize that it is relatively easy to find "nit-picking" problems in any comprehensive report prepared by a multi-disciplinary task force constrained by limited budget and time.

The purpose of this critical review is not to criticize minor flaws, but rather to focus on substantive issues where serious errors have been made. It is essential that these errors be corrected prior to releasing the Final Environmental Statement because major policy decisions will likely be based on findings and conclusions published by the U.S. Geological Survey and the Montana Department of State Lands.

The criticisms raised in this review focus on three major problem areas:

1. The description of the existing air quality environment near Colstrip, Montana is not objective nor is it accurate.
2. Identification of sources of particulate near Colstrip are subjective and unsubstantiated.
3. The modeling analysis is not well documented; it appears to be inadequate for an environmental statement of this scope, and predicted TSP concentrations expected to occur in 1985 should be viewed cautiously.

Each of these areas is discussed next in SECTIONS 2.0, 3.0, and 4.0. This critical review concludes with a list of recommendations for further investigation.

2.0 EXISTING AIR QUALITY

The characterization of the existing air quality near Colstrip is important because it is the baseline upon which future ambient air changes will be superimposed. The Draft Environment Statement (DES) does not properly characterize the air quality in Colstrip. On Page II-36 the DES concludes:

"... Fugitive dust has become a problem near the mines at Colstrip and Decker. Particulate air-quality standards in these areas have been violated, and approximately 120 square miles in the Colstrip area has been classified as a nonattainment area for total suspended particulates (TSP)."

In fact, the air quality in and around Colstrip has been steadily improving since 1976. Table 2.1 shows values of annual geometric mean (AGM) and second highest 24-hour TSP concentrations sampled in a one-year time span, the two measures of air quality for which State and Federal standards are written.

SITE	1976		1977		1978	
	AGM	2nd HI	AGM	2nd HI	AGM	2nd HI
Montana Power #3 (Town of Colstrip)	103	306	92	306	59	255
AQB-BN (South of Colstrip)	28	92	25	71	17	112
Western Energy #1 (West of Colstrip)	(1)		42	309	45	279
Peabody Coal - Substation	32(3)	375	21(2)	89	21(4)	109

- (1) Insufficient data
 (2) October 1976 - September 1977
 (3) October 1975 - September 1976
 (4) November 1977 - October 1978

LETTER 35

The DES statement cited above ("...Particulate air-quality standards in these areas have been violated, and approximately 120 square miles in the Colstrip area has been classified as a nonattainment area...") is misleading in that it implies that there are 120 square miles of area that do not attain standards. The designation of the region of nonattainment was made along arbitrarily chosen boundaries, and includes areas which have always complied with TSP standards as indicated by measured concentrations at specific hi-vol sampling sites.

On Page II-37 of the DES, the following statement is clearly in error:

"Colstrip has a serious fugitive dust problem: both the annual geometric mean and the 24-hour maximum TSP concentrations are in violation of the National Ambient Air Quality Standards..."

Table 2.1 of this review demonstrates that the annual geometrics mean at all sites in 1978 is in compliance with Federal primary and secondary standards.

3.0 IDENTIFICATION OF TSP SOURCES

The identification of particular activities or facilities as sources of pollution is extremely important because it shows which areas should be controlled to improve ambient air quality. The DES incorrectly concludes that the primary source of particulate around Colstrip is Western Energy Company's coal handling facility and coal storage pile (p. II-37):

"...Colstrip is the only nonattainment area for TSP in the Coal Area, Air Quality Maintenance Area (AQMA). Most of the dust apparently comes from the Rosebud Mines..., notably from unprotected coal handling facilities...and from uncovered coal piles."

Also, on Page II-37:

"...The strip mines and particularly the coal handling facilities, not the town, are the major sources of particulates..."

The DES reinforces the allegation that the coal storage pile is the major source by inclusion of photographs (Figure II-15 and Figure II-16) of the coal handling area. The photograph of the Area A loadout taken after a snowfall, Figure II-15, illustrates only that the coal dust is black, and that it settles out before being transported downwind of Western Energy's property line. Similarly, Figure II-16, a photograph of blowing coal dust at the loadout pile, demonstrates that under high wind conditions coal dust blows off the pile during load-in. Whether this is a frequent occurrence, or only a rare event which contributes little to the total air contaminant burden, is not explained.

In fact, the coal handling and coal storage facility at Rosebud are

relatively minor sources of particulate. Projected 1980 emissions from the Rosebud Mine are illustrated in Table 3.1

Table 3.1

1980 PARTICULATE EMISSIONS FROM ROSEBUD MINE
(TONS/YEAR)

<u>ACTIVITY</u>	<u>EMISSIONS</u>
Coal Removal	13.1
Overburden Removal	77.4
Scraper Operations	320.0
Haul Roads	1100.4
Disturbed Area Wind Erosion	1259.7
Coal Storage Truck Dump, and Train Loading	151.7

Table 3.1 was calculated from Survey of Fugitive Dust from Coal Mines (3), PEDCo Environmental, 1978, and Western Energy Company's Preliminary 10 Year Plan.

Another emissions inventory prepared by PEDCo (2) confirms the findings in Table 3.1, computing haul road emissions as 1065 tons/year, and construction activities in Colstrip at 770 tons/year, considerably greater than those due to Western Energy's coal storage pile. It is clear that the storage pile and loading facilities are not the culprits that the DES portrays them to be.

The inherent problem with the DES statements concerning the coal storage pile is that they will very likely prompt control measures aimed at reducing emissions from the pile, when control effort should focus instead on the haul roads and on construction activity within Colstrip.

4.0 AIR QUALITY MODELING

Computer simulation models that calculate ambient air concentrations as a function of pollutant emission rates and meteorology provide a rough estimate of air quality at best. The task of modeling wind blown dust, as opposed to gaseous pollutants, is even more difficult, owing to the lack of precision in emission rates and the additional complexity of gravitational settling associated with particulates. The Environmental Protection Agency, is an attempt to standardize the use of various models, has published a Guideline on Air Quality Models⁽⁴⁾. The Guideline concludes that modeling of wind blown dust is a speculative matter:

"The models presented in this guide for estimating ambient concentrations of suspended particulate matter assume that the particles disperse as a gas and emanate from well-defined sources. Unfortunately in many areas, particularly where the air quality standards are not being attained, these assumptions may not hold. Windblown dust, re-entrained street dust, dry-land farming, and raw-material handling operations, all of which are often referred to as fugitive dust sources, can be significant sources of particulate matter. EPA has several ongoing studies concerned with fugitive sources of dust; however, the rate and distribution of particulate emissions from these sources is not fully known. As a result, a widely applicable model for routinely estimating particulate concentrations attributable to fugitive sources is not available."

In view of the difficulties associated with modeling fugitive emissions, it seems reasonable that modeling results presented in the DES would be qualified, or that some measure of error would be assigned to computed concentrations. Yet the only disclaimer appears on p. II-49 of the DES:

"...Because of the uncertainty in fugitive dust emission factors used in the model, the actual concentrations and rates may be somewhat larger or smaller than predicted."

Other problems arise with interpretation of the modeling results. On p. II-49,

LETTER 35

a discussion of results gives the impression that a very large area was impacted by the Rosebud Mine:

"...Because current measurements of concentrations are incomplete, particulate emissions from both the Rosebud and the Big Sky mines were modeled to estimate 1978 TSP concentrations (Fig. II-25). TSP concentrations of up to $5 \mu\text{g}/\text{m}^3$ above the background $20 \mu\text{g}/\text{m}^3$ were modeled from 10 to 12 miles downwind of the strip mines. Approximately 250 square miles could have recorded increases in TSP due to mining in 1978."

All Gaussian models, the type used in the DES study, predict concentrations that decrease asymptotically with distance, but never reach a true zero concentration. Consequently, the model itself will indicate that an infinite area records TSP increases. The methodology used to draw the line at 250 square miles should be discussed in the DES. Similarly, the modeled extent of the area affected by dustfall should be better defined.

The choice of the model used to simulate dispersion and deposition is a difficult matter. As explained, the EPA does not endorse a particular model for application to surface mining applications. The DES modeler used a modified version of a model developed for gaseous pollutant dispersion⁽⁵⁾. More accurate, technically rigorous models are available to simulate coal mining operations (eg., ATM, modified CDM). These other models have been more extensively tested and validated; consequently it seems that the DES authors should justify their use of a non-standard model.

5.0 RECOMMENDATIONS

The Draft Environmental Statement: Northern Powder River Basin

Coal, Montana was written to comply with the National Environmental Policy Act of 1969. As such, there are certain requirements that the DES must satisfy, one of which is to present full disclosure of the environmental impact from proposed activities. It is not enough to present a partial view of the environmental impact in the DES. The failure to observe that the air quality around Colstrip is improving should be rectified by including a discussion of TSP concentration trends. This discussion should address such questions as, "Why are ambient concentrations decreasing?", "Will the trend continue in the future?", and "Is there a conflict between the measured improvement in air quality at Colstrip and the DES predictions that air quality will deteriorate?".

A second deficiency in the DES is the conclusion that "...most of the dust apparently comes from the Rosebud Mines...", notably from unprotected coal handling facilities (fig. II-15) and from uncovered coal piles.". The DES should not rely on photographs to guess where the dust originates, but should instead present a quantitative emissions inventory. Additionally some quantitative estimate of the impact on measured concentrations from individual sources should be made to determine whether the coal pile, for example, is contributing to ambient concentrations in Colstrip, or whether the coal dust settles out before being blown across Western Energy's property line. If there are certain controls that should be applied to lessen the impact of coal development, these should be discussed.

LETTER 35

Finally, a written justification of the air quality model used to predict future concentrations should be provided, as this is apparently the methodology used in the DES to assess air impacts.

REFERENCES

1. U.S. Geological Survey, Department of the Interior and Montana Department of State Lands, Draft Environmental Statement, Regional Analysis, Northern Powder River Basin Coal, Montana, 1979.
2. State of Montana, Air Quality Control Implementation Plan, vol I, Air Quality Bureau, Dept. of Health and Environmental Services, Helena, Montana, 1979.
3. PEDCo - Environmental, Inc., Survey of Fugitive Dust from Coal Mines, contract No. 68-01-4489, EPA Region VIII, Office of Energy Activities, Denver, Colorado, Feb. 1979.
4. U.S. EPA, Guideline on Air Quality Models, Office of Air Quality Planning and Standards, RTP, N. Carolina, 1977.
5. Personal telephone conversation with Mr. Bob Boldi, August 23, 1979.

LETTER 35

COMMENTS

The following are comments on the Northern Powder River Basin Coal, Montana, Draft Environmental Statement (DES), prepared by C. F. Cole and G. J. Fletcher, Environmental Consultants.

These comments will specifically address the statements made in the DES, regarding Air Quality for Western Energy Company's (WECO) Rosebud Mine at Colstrip, Montana.

Statement - Page II - 35

D. AIR QUALITY

The air quality of the six-county study area is generally excellent, except for local fugitive dust and gaseous emissions from strip mines and the plume from Colstrip Units 1 and 2. Rural areas and most towns have pristine air. Maximum visibility ranges from 350 miles at Colstrip to 35 miles near Decker; however, fugitive dust has become a problem near the mines at Colstrip and Decker. Particulate air-quality standards in these areas have been violated, and approximately 120 square miles in the Colstrip area has been classified as a nonattainment area for total suspended particulates (TSP). Violations of the standards for sulfur dioxide downwind of the Colstrip power generating units have not been recorded.

Comment -

35PP See responses 35K and 35L.

35PP The first sentence is false when the emissions in Table II-11 and Table II-12 are compared. The SO₂, NO_x and HC (gaseous emissions) are a factor of 10 higher than for the coal mines. If local fugitive dust is only from the strip mines, why are Forsyth, Miles City and Broadus mentioned on page II-40 as having elevated dust fall problems?

A review of the Montana SLP indicates that other towns in Montana have violations of fugitive dust (Libby) but since there was no coal mine to blame for the problem they were not classified non-attainment.

Statement - Page II-37

Colstrip has a serious fugitive dust problem: both the annual geometric mean and the 24-hour maximum TSP concentrations are in violation of the National Ambient Air Quality Standard (NAAQ, table III-2). Colstrip is the only nonattainment area for TSP in the Coal Area, Air Quality Maintenance Area (AQMA). Most of the dust APPARENTLY comes from the Rosebud mines (PEDCo, 1978), notably from unprotected coal handling facilities (fig. II-15) and from uncovered coal piles. The handling of coal at the Rosebud mine is also poorly protected from wind erosion (fig. II-16). The problem is most severe during windstorms (fig. II-17).

Comment -

35QQ

The comment is partially from a statement on page II-36:

"Because the climate in eastern Montana is semiarid, fugitive dust can be a major air pollution problem (table II-10). The sources are unpaved roads, fallow fields, overgrazed land, exposed soft rock outcrops, towns and strip mines."

WECO is cognizant of the fugitive dust from the Rosebud mine, but only would like to state here that there are obviously other contributors to the fugitive dust reoccurrence at Colstrip.

Research of the PEDCo and MMT data indicates that the haul roads, not the coal storage piles, are the major contributor to the dust. The use of

35QQ See response 35K.

word 'apparently' is totally unprofessional considering the tremendous amount of on-site data available.

The use of photos, Figures II-15, II-16, and II-17, are not representative since the conditions at that time cannot be reproduced.

Statement - Page II-37

The strip mines and particularly the coal handling facilities, not the town, are the major sources of particulates (PEDCo, 1978 MDHES hearing record, 1978).

Comment -

35RR

PEDCo data, if reviewed, indicates that this is a false statement.

The hi-vol sample located in the town is affected by the town. This can be substantiated by reviewing other towns in Montana that have non-attainment status and no coal mines.

The MDHES hearing record is not a part of the bibliography and there is no way to ascertain the validity of the statement.

35RR See response 35L.

Statement - Page II-37

Figure II-15, an aerial view of the uncovered coal-handling facilities at Rosebud Area "A" 3 days after a light snowfall in January 1979, shows much more dust on the ground than at the nearby Big Sky mine (fig. II-18)

Comment -

35SS

The Rosebud Mine produces 12 million tons/year of coal. The Big Sky

35SS See response 35N.

LETTER 35

mine produces 2 million tons/year of coal.

Statement - Page II-40

Dustfall, a measure of particulates which settle out of the air, has violated the Montana guideline (15 tons/mi²/month) in Forsyth, Colstrip, and Miles City, and Broadus (fig. II-20). The elevated dustfall in Forsyth and Miles City may be due to relatively high population density and to train traffic; those in Broadus, to relatively high agricultural activities; those in Colstrip, mainly to the Rosebud mine. On page II-49 the statement is made that the mobile home park has unusually high TSP readings. The park is not in the prevailing direction of the mine.

Comment -

35TT

The high dustfall at Colstrip could also be from over grazing, construction (normally not included in the calculations, except at Colstrip), unpaved roads and the town.

35TT

The sources mentioned in the comment do contribute to dustfall in the Colstrip area. The strip mines are considered to be the major sources on the basis of studies cited. See also response 35L.

Statement - Page II-43

The buttes 3 miles north and south of Colstrip tend to be impacted most heavily by the powerplant plumes. Gordon and others (1978) have documented subtle injury to conifers in these areas.

Comment -

35UU

There is NO evidence in the data to substantiate this statement.

35UU

Evidence for this statement is found at pages 7, 11, 19, 21, and 27 of Gordon and others (1978). Plume strikes during fall and winter of 1977 were recorded at the EPA Hay Coulee site with 1-hour concentrations for SO₂ and NO₂ of 0.029 ppm and 0.043 ppm, respectively. Since a high ridge separates the valley monitoring site from Colstrip, "it can be assumed that plume strikes also occur at our ponderosa pine-skunkbush sites located on the most elevated ridges in the Colstrip area (Gordon and others, 1978, page 7)."

Statement - Page II-49

5. Air Quality Modeling, Colstrip Area, 1978

The air quality model used to predict dustfall and total suspended particulate (TSP) levels was provided by the University of Montana. A full description of the computer model is available from the Montana Department of State Lands, Capitol Station, Helena, Montana 59601. The model gives a best estimate of particulate concentrations and dustfall based on available data. Because of the uncertainty in fugitive dust emission factors used in the model, the actual concentrations and rates may be somewhat larger or smaller than predicted.

Comment -

35VV

Because of the uncertainty in fugitive dust emission factors and the bias hi-vol used in determining that Colstrip was non-attainment, perhaps an argument could be made to change the air quality status.

35VV Noted.

Several other non-attainment areas have challenged the status and have won in court litigation.

Statement - Page II-49

a. TOTAL SUSPENDED PARTICULATES

Because current measurements of concentrations are incomplete, particulate emissions from both the Rosebud and the Big Sky mines were modeled to estimate 1978 TSP concentrations (fig. II-25). TSP concentrations of up to 5 $\mu\text{g}/\text{m}^3$ above the background 20 $\mu\text{g}/\text{m}^3$ were modeled from 10 to 12 miles

downwind of the strip mines. Approximately 250 square miles could have recorded increases in TSP due to mining in 1978.

Comment -

35WW Don't make subjective statements. If no data was recorded and since the previous paragraph stated that the modeling is less than accurate, the last sentence should be deleted.

Statement - Page II-49

TSP readings are unusually high in the mobile home court north of the powerplant's coal handling facilities.

Comment -

35XX The mobile home court is northwest of the Rosebud mine, and the prevailing wind is from the northwest.

Statement - Pages II-49 and II-51

The modeled 1978 annual geometric mean concentration for TSP at Colstrip was about $50 \mu\text{g}/\text{m}^3$. In 1977, the observed mean concentration was $81 \mu\text{g}/\text{m}^3$, and the observed 24-hour maximum concentration was $306 \mu\text{g}/\text{m}^3$; both concentrations violated the NAAQS for TSP. The model predicts a 24-hour maximum of $124 \mu\text{g}/\text{m}^3$ during the summer. Since the model is unable to account for dry summer weather, violations of the 24-hour TSP standard are difficult to predict.

35WW The cited sentence is intended to predict what might have been observed had monitors been in place.

35XX Noted. The coal storage pile for the powerplant would probably affect the trailer court more than the Rosebud mine.

LETTER 35

Comment -

35YY The available data indicates that the annual geometric means concentration for TSP has been decreasing each year at Colstrip as more of the short term construction is completed.

The last statement is a cop-out since the model could be adjusted for increased summer emissions.

Statement - Page II-50

This is a figure (II-25) indicating modeled annual geometric mean TSP $\mu\text{g}/\text{m}^3$ during 1978 in the Colstrip area.

Comment -

35ZZ Why is the predicted concentration so much higher than the real annual geometric mean recorded at a hi-vol station? ($59 \mu\text{g}/\text{m}^3$ at MPCo #3, 1978 as opposed to the isopleth in figure II-25 of +300).

Statement - Page II-51

b. Dustfall

Dustfall tends to follow the same geographic patterns as TSP (fig. II-27). Generally, predicted violations of the 3-month dustfall standard are confined to the immediate vicinity of the mine. In 1978, approximately 200 square miles were affected by dust from the mines. (fig. II-27).

35YY Construction of Colstrip units 3 and 4 can be expected to increase TSP readings in Colstrip.

35ZZ Monitor MPC No. 3 is in Colstrip, west of the generating units, and outside the 300+ TSP isopleth. Total precipitation in the Colstrip area during 1978 was 22 inches--139 percent of the 1941-70 average --which would reduce actual concentrations. From October 1978 to April 1979, the TSP geometric mean concentration recorded at MPC No. 3 was $94.5 \mu\text{g}/\text{m}^3$ --in good agreement with the predicted concentration of $100 \mu\text{g}/\text{m}^3$ in figure II-25. However, during this period precipitation was 79 percent of normal.

Comment -

35AAA

If dustfall is confined to the mine, how can 200 square miles be affected?

35AAA The larger area is affected by lower concentrations of dust. Volume 1 states that the predicted dustfall violations--not all the dust--would generally be confined to the mine area.

Statement - Page II-51

c. MODEL DEFICIENCY, FINE PARTICULATES

The model does not estimate the amount of fine particulates from the mines, because it is calibrated after real TSP data at Colstrip, and only reflects these crude measurements of the ambient particulate problem. Fine particulates weigh too little in relation to the larger particles collected to be recorded as significant portions of a dust sample. Thus, the model assumes that fugitive dust from strip mines consists almost entirely of large-diameter particles which settle out close to the source.

Comment -

35BBB

A dicotomus sample could do fine particulates. It is much easier for a model to simulate fine particulates, than the heavy particulates.

35BBB The model was calibrated using real TSP data from the Colstrip area high-volume samplers, none of which are dichotomous samplers. The model predicts total suspended particulate by weight with no particle size differentiation. If only fine particulates were emitted, the comment would be correct; the samplers measure weight, not the number of particles; therefore, the large (heavy) particulates dominate the results.

LETTER 36



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VIII
1860 LINCOLN STREET
DENVER COLORADO 80203

Ref: 8M0

Mr. H. William Menard
Director, U.S. Geological Survey
National Center, Mail Stop 108
Reston, Virginia 22092

Dear Mr. Menard:

36A We have completed our review of the draft environmental impact statement for the Northern Powder River Basin Coal, Montana, and for the Proposed Mining and Reclamation Plan, Pearl Mine, Montana. The Northern Powder River Basin regional EIS describes the environmental impacts that can be expected from the development of surface coal mine operations in the area which are currently being evaluated by Federal agencies. The EIS also describes impacts resulting from operation of the Colstrip power plant. The EIS does not attempt to analyze impacts from future proposed mining activity. A more complete analysis of the regional cumulative hydrologic/water quality impacts should have been provided. Water quality and water resource impacts on the Tongue River drainage system resulting from the low, intermediate and high coal projections should be analyzed.

Additional specific comments are as follows:

- 36B 1. The air quality discussion on BACT for mines is outdated. The recent Alabama Power et. al. vs EPA decision essentially exempts surface coal mines from PSD review.
- 36C 2. The air quality discussion for the Colstrip power plant is outdated and inaccurate. A PSD permit requiring SO₂ emission rate of 0.18 #10⁶ BTU (24 hour average) was recently issued. The power plant NSPS were revised in June 1979.
- 36D 3. High concentrations of mercury have been found in the Tongue River Reservoir. We have a concern regarding the exacerbation of this situation.

36E As stated in the EIS, this region of Montana can expect significant environmental and social change and damage from accelerating industrialization of a presently rural area. With proper application of state and local law, however, these impacts can be controlled and mitigated to some degree.

According to EPA's rating system, this regional EIS is rated ER-2 (environmental reservations - insufficient information).

The letter from EPA was received too late to allow a complete response.

36A The analysis of hydrologic impacts has been improved; however, the conclusions remain unchanged.

36B The discussion of BACT in the regional statement will be out of date once EPA complies with the Alabama Power decision. At this time, however, the discussion still applies.

36C Noted. The permit for units 3 and 4, and the revised NSPS, were issued after the regional analysis was completed.

36D The high concentrations noted may have been due to faulty sampling procedures. High mercury levels, if present, are not necessarily related to mining.

36E Noted.

-2-


The Pearl Mine EIS describes another situation where air quality, wildlife, water quality, social and economic values will be impacted and, in many cases, damaged. However, the EIS suffers from having to discuss an outdated mining and reclamation plan. An updated version is currently awaiting the review of OSM. Since the EIS does not address a current situation, we suggest that a supplemental EIS be prepared in conjunction with the OSM review. We offer the following observations on the project as described.

1. Mining in an alluvial valley floor is the major issue. The mine plan must reflect due consideration to alluvial valley floor requirements if determined to be applicable by OSM under SMCRA.
2. Diversion of Little Youngs Creek may cause water quality impacts unless the diversion is properly designed. There is no information in the EIS to evaluate the design.
3. Since there are no existing contracts for the coal, is the project necessary? It has been stated that the coal mining capacity is greater than present demand by about 150 million tons per year.
4. Stronger commitment to air pollution control should be provided including use of chemical dust suppressants on haul roads, paving of access roads, use of baghouses on coal crushing and conveying, stabilization of topsoil, etc. should be stipulated.

The EIS is rated ER-2 (environmental reservations - insufficient information). The 2 rating refers to the lack of an adequate mining plan.

If you have any questions, please contact Mr. Gene Taylor of our Montana Office at FTS 585-5432.

Sincerely yours,


Roger L. Williams
Regional Administrator

LETTER 37



United States Department of the Interior

NATIONAL PARK SERVICE
WASHINGTON, D.C. 20240

IN REPLY REFER TO:

L7621 (135)

Memorandum

To: Director, U.S. Geological Survey, Reston, Virginia
From: ACTING DEPUTY Director, National Park Service
Subject: Review of draft environmental statement for Development
of Coal Resources in Southeastern Montana (DES 79-41)

As requested, we have reviewed the subject document. Custer Battlefield National Monument, some 25 miles west of the designated region, is the nearest unit of the National Park System. It is a Class II air quality area and the statement seems to be aware of this classification level. Since no other units of the National Park System are involved, we offer no other comment.

Noted.



D. INDEX TO COMMENTS

This index shows which comments pertain to the various subjects discussed in volume 1. Each letter received is identified by a number; each comment requiring response is identified by a capital letter. Comment 2E, for example, is the fifth comment within letter 2, and it deals with the discussion of geology in volume 1.

1. Summaries (see summary and chapters V through VII): 5A, 8A, 19K, 20J, 20T, 27T, 27U, 29A, 30J, 30K, 30L, 30W, 30EE, 30FF, 30GG, 31E, 31G, 31K, 32S, 32T, 32U, 33A, 33E.
2. Background and Scope (see chapters I and VIII): 8B, 8C, 19A, 20A, 21A, 23A, 29A, 30W 31A, 31B, 31C, 31D, 31E, 31F, 31H, 31K, 32A, 35A, 35B, 35C.
3. Laws and Regulations (see chapter III): 15E, 27N, 28J, 30R, 30S, 32M.
4. Consultation (see chapter IX): 19H.
5. References (see chapter X): 19J.
6. Resources (see chapters II, IV, and VIII)
 - a. Geology: 2E, 2F, 2G, 2H, 15A, 15B, 19F, 24A, 24B, 24C, 27O, 28A, 30A, 30B, 30C, 30T, 30U, 33A, 35E, 35F, 35HH, 35II.
 - b. Hydrology: 2D, 2F, 2I, 10A, 15C, 19G, 21B, 24B, 25B, 26A, 26B, 30D, 30E, 30F, 30V, 30W, 30X, 30HH, 33F, 35G, 35H, 36A, 36D.
 - c. Climate: 27A, 27B, 27C, 27P.
 - d. Air quality: 5A, 5B, 5C, 5D, 8D, 10C, 19C, 19D, 19E, 27E, 27F, 27G, 27H, 27I, 27J, 27K, 27L, 27Q, 27R, 28E, 28H, 28I, 30G, 34A, 34B, 35K, 35L, 35M, 35N, 35O, 35CC, 35DD, 35EE, 35QQ, 35RR, 35SS, 35TT, 35UU, 35VV, 35WW, 35XX, 35YY, 35ZZ, 35AAA, 35BBB, 36B, 36C.
 - e. Soils: 12A, 24A, 24C, 24D, 29B, 29C, 29D, 29H, 29I, 29K, 30H, 33A, 33C, 33E.
 - f. Vegetation: 24D, 27S, 29E, 29F, 29I, 29J, 29L, 35LL, 35MM.
 - g. Wildlife: 2G, 2J, 2K, 8E, 13A, 17A, 17B, 27M, 28K, 28L, 28M, 29N, 29Q, 29R, 29S, 29T, 29U, 29V, 30Y, 30Z, 30AA, 30II, 32N, 35Q, 35R, 35S, 35NN.

- h. Social environment: 4A, 10D, 10E, 20B, 20C, 20D, 20E, 20L, 20M, 20U, 25A, 28E, 30I, 30J, 30K, 30BB, 30CC, 30JJ, 31K, 31L, 31M, 31N, 31O, 31Q, 31U, 31V, 32C, 32D, 32E, 32F, 32O, 35T, 35U, 35W, 35X, 35Y, 35Z, 35AA, 35FF, 36E.
- i. Economics: 10F, 10I, 20H, 20I, 20N, 20O, 20P, 28B, 28C, 28D, 28F, 30KK, 30LL, 31W, 31X, 31Y, 31Z, 31AA, 31BB, 32G, 32I, 32J, 32K, 32P, 32Q, 35GG.
- j. Community services: 4A, 4B, 5A, 5E, 5F, 10G, 30L, 30M, 31Q, 31R, 31S, 31T, 31U, 35BB, 35OO.
- k. Land ownership and use: 20Q, 20R.
- l. Transportation: 3A, 6A, 6B, 10H, 20S, 30DD, 30MM.
- m. Recreation: no comments received.
- n. Cultural resources: 1A, 2L, 14A, 14B, 18A, 30P, 32R.
- o. Esthetics: 30Q, 32L.

E. CHANGES AND CLARIFICATIONS

Changes made in volume 1 (regional analysis) in response to public comments are listed below.

1. Text Changes

<u>Page</u>	<u>Change</u>
I-1	Change the last line of paragraph 2 to read: "Surface Mining Control and Reclamation Act of 1977."
I-6	The first sentence of paragraph 4 should be revised as follows: "The three mine permit applications include <u>750</u> acres of land in public ownership and <u>5,050</u> acres in private surface ownership."
II-7	Paragraph 2, line 2: Change table III-5 to table III-4.
II-13	Change the last sentence in the last paragraph to read: "Colstrip generating units 3-4 (now approved) are on East Fork Armells Creek which drains into the Yellowstone River. The proposed Big Sky expansion is on tributaries of Rosebud Creek."
II-13	Add to end of paragraph 5: "Current use by all existing mines in the area for sanitary purposes, dust control, equipment washing, etc., totals about 500 acre-feet/year."
II-36	The fourth sentence in paragraph 1 is revised to read, "Maximum concentration in rural areas ranged from 50 to 243 ug/m ³ in 1977."
II-37	Paragraph 1, line 6: change 1978 to 1977.
II-43	Revise paragraph 1 to read: "Total annual SO ₂ emissions from units 1 and 2 were projected in 1974 to be 23,700 tons (Montana Department of Natural Resources and Conservation, 1974)."
II-43	Change "U.S. EPA" on footnote 5 to "representing Battelle Pacific Northwest Laboratories."
II-43	Delete the words "for the most part" in sentence 2 in paragraph 4.
II-43	Revise paragraph 3, lines 1-4 to read: "During plume strikes 7.3 miles downwind of Colstrip units ₁ and 2, mean hourly SO ₂ concentrations average about 11.6 ug/m ³ (.005ppm); maximum hourly SO ₂ concentrations have been 115 ug/m ³ (.05ppm) at 2.6 miles and 42 ug/m ³ (.018ppm) at 7.3 miles* * *"
II-46	Paragraph 1, line 3: delete "However, this creates considerable CO ₂ emissions."

<u>Page</u>	<u>Change</u>
II-63	Change the last sentence of paragraph 3 to read: "The distribution of vegetation is controlled by a number of equally important and interrelated factors, including precipitation, soils, aspect, land use, and elevation."
II-75	Paragraph 4, lines 7-8: delete phrase beginning with "* * *although ring-necked pheasant* * *"
II-75	The last sentence should read: "The east fork also has a minor fishery in the perennial reach near its mouth."
II-77	Paragraph 5, line 5: change "also lost" to "won".
II-77	Paragraph 6, line 6: Delete the "s" in "Lowies".
II-78	Insert "gold" before "miners" in the first sentence.
II-78, II-79	Change the last sentence to read: "Mining began at Colstrip in 1924, and although it reached a peak production rate of nearly 2.6 million tons in 1943, it had relatively little effect on the primarily agricultural society."
II-79	Delete the last sentence in paragraph 2.
II-82	Paragraph 5, line 3: change "premining" to "long term".
II-90	Insert at end of section <u>c</u> , Unemployment: "The U.S. Bureau of Indian Affairs reports that the hiring and laying off of Indian workers at Colstrip has had adverse effects on the Northern Cheyenne Tribe."
II-103	Change the last sentence of paragraph 4 to read: "* * *because the Supreme Court gave the Northern Cheyenne control of all Reservation coal."
II-125	Change sentence 4 of paragraph 7 to read: "The remaining 14 sites are not believed to be eligible for the National Register * * *"
II-128	Paragraph 1, line 6: change 1976 to 1974.
III-3	Change the list in paragraph 1 to read: "This Act is implemented by the Office of Surface Mining (OSM) under 30 CFR 700, which provides for: o Development of the initial regulatory program to be incorporated into coal mining permits issued under State and Federal law; and

<u>Page</u>	<u>Change</u>
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- o Implementation of the permanent regulatory program:
 - 1) Environmental performance standards for surface coal mining and reclamation operations;
 - 2) Requirements and approval procedures for State programs;
 - 3) Requirements for surface coal mining and reclamation operations on Federal lands and Federal-State cooperative agreements for the Federal lands program;
 - 4) Requirements for development and implementation of a Federal program for a State;
 - 5) Requirements and procedures for approval of State and Federal mining permits;
 - 6) Inspection and enforcement procedures, including the assessment of civil penalties;
 - 7) Requirements for posting, release, and forfeiture of reclamation performance bonds; and
 - 8) Assistance to small operators in meeting permit application requirements."

III-12 Last paragraph, line 1: change "Treat" to "Treaty."

IV-69 The last sentence of paragraph 3 should be changed to read:
 "Travel between the Colstrip and Decker areas across the Northern Cheyenne Indian Reservation would probably increase slightly--well within existing road capacities."

VII-5 Paragraph 5: change "would" to "may"; delete "significantly."

VIII-5 Delete the last 3 sentences in paragraph 4.

VIII-13 Paragraph 1: change 1981 to 1982, 1983 to 1984, and 1983 to 1984.

VIII-29 Paragraph 2: change the last part of the third sentence to read:
 "* * * would amount to 85 million tons of coal per year, or about 46 trains per day, based on projected coal exports by 1990."

2. Corrections and Additions to Figures and Tables

Figure I-1.--Map showing parts of southeastern Montana and northern Wyoming discussed in the regional EIS. The dot pattern identifies the "designated region" within which proposed

coal developments have been analyzed site-specifically. The map shows ongoing and proposed mines and coal-fired electric generating units included in the intermediate (most probable) level of production.

Item 1: Coal Creek mine is located about 1 mile inside the Custer National Forest.

Items 6 and 7: Colstrip units 3 and 4 have been approved.

Item 8: Spring Creek mine has been approved.

Figure II-5.--Distribution of Federal and non-Federal minerals ownership in the designated region. Gray, designating Federal minerals ownership, should be the same density in the explanation block as on the map.

II-12.--Periodicity of precipitation in the northern Powder River basin. The smooth curve portrays cyclic change with a frequency of about 21 years--approximately that of the widely recognized sunspot cycle, although it is not necessarily in phase with the sunspot cycle. See response 19I.

II-15.--Area A loadout at the Rosebud mine, Colstrip, 3 days after last snowfall. Uncovered coal storage facilities are a source of fugitive coal dust. See response 35N.

II-16.--Lowering boom at the Area A loadout pile, Rosebud mine. See response 35L.

II-18.--Big Sky mine and Rosebud mine loadouts, 3 days after last snowfall. See response 35N.

II-19.--Absaloka mine loadout, 3 days after last snowfall. The picture is upside down.

II-25.--Annual geometric mean TSP during 1978 in the Colstrip area. See comment 35ZZ. Townships are mislabeled in this figure and in figures II-26, II-27, II-37, and figures IV-3 through IV-7:

T. 1 N. should be T. 1 S.

T. 2 N. should be T. 1 N.

The Colstrip nonattainment area is not plotted on the listed illustrations, but can be envisioned as an area about 11 miles square in which the town of Colstrip is centered.

II-34.--Mule deer winter ranges in the Decker subregion. Townships are mislabeled in this figure and in figures II-29,

II-31, II-35, II-36, IV-8, and IV-9:

T. 7 N., T. 8 N., T. 9 N., should be T. 7 S., T. 8 S., T. 9 S.

II-36.--Raptor and game bird use areas in the Decker subregion.
See response 29P.

II-38.--Characteristics of poverty-level households in the study area, Montana and Wyoming. See response 20G.

Figure II-42.--Transportation routes in the study area. The railroad to Birney from the Big Sky mine does not now exist. See response 30N.

IV-8.--Annual geometric mean TSP in the Decker area during 1985.
See response 31J.

IV-10.--Potential range of forage production on reclaimed mined land.
See response 35LL.

Table I-1.--Coal production in the study area (1978-1990). The projected levels of production, shown in 5-year increments, are thought to be most likely based on the present rate of production and trends of development in the area. The Spring Creek mine was approved after table I-1 was prepared, and it should be included with existing mines. The overall production is not altered. See response 31D.

I-2.--Proposed coal mines in the designated region. The Spring Creek mine is no longer proposed; it has been approved. The regional analysis included the Spring Creek mine because it had not been approved when the EIS was initiated. See response 31F.

II-1.--Coal production from operating strip mines in 1978. Big Horn Coal Company operates in Sheridan County, Wyoming.

II-3.--Calculated probability of the largest 24-hour or 6-hour rainstorms expected during various lengths of time. The 24-hour precipitation figures are calculated from precipitation records; the 6 hour figures are estimated from isopleths on a published map (Miller and others, 1973).

II-11.--1978 emissions from minesite internal combustion engines and blasting, based on emission factors published by the Environmental Protection Agency (EPA, 1976a).

II-12.--Estimated gaseous and particulate emissions based on resident population, 1978, based on emission factors published by the EPA (1976a). The table does not include emissions from mines and generating units. Resident populations in 1978 were as follows:

Colstrip---	2,742
Forsyth----	2,474
Hardin-----	3,304
Hysham-----	600
Broadus----	900
Sheridan---	16,080

II-18.--State of Montana stream fisheries classification for the Northern Powder River basin. Tongue River II (Tongue River dam to Wyoming line) should be Tongue River III. See response 8E.

II-19.--Population growth and decline in the northern Powder River basin study area, 1940 to 1990--the baseline. See responses 31I and 35Y.

Table II-20.--Employment by broad industry and sector, 1940.

II-21.--Employment by broad industry and sector, 1970.

II-22.--Employment by broad industry and sector, 1975.
See response 32H.

II-44.--Train/vehicle accidents, January 1972-July 1977. See response 30U and Appendix A to letter 30.

III-1.--Federal ambient air quality standards. Photochemical oxidants, under Federal primary standards, should be 235 ug/m³ and 0.12 ppm.

IV-3.--1985 emissions (tons/yr) from minesite internal combustion engines and blasting.

IV-5.--Range of estimates of coal dust losses from unit trains (tons/mi²/yr), intermediate level of production. Sources of data: Nimerick and Laflin (1977), Paulson and others (1976).

IV-6.--Locomotive diesel emissions (lb/mi/yr) from coal trains, intermediate level of production. Source of emission factors: URS (1976).

IV-7.--Potential controlled gaseous emissions from Colstrip units 1 through 4, burning Area C coal 80 percent of the time at full capacity (tons/yr).

IV-13.--Projected revenues, Montana (1970 dollars). Severance tax should be added as a source of revenue. See response 28C.

IV-16.--Projected impacts on community services in Rosebud County, 1978-1990. See response 3500.

3. Clarification of Scope and Purpose

A number of commenters requested additional explanation of the guidelines and assumptions under which the regional statement was prepared. See also volume 1, chapter I.

a. Purpose

This regional environmental statement is 1 of 10 such statements prepared under directions issued by the Secretary of the Interior on April 29, 1976. The purpose of the regional statements, as defined by the Department of the Interior, was to assess cumulative environmental impacts expected to result from development of coal resources within 10 designated regions.

b. Scope

The "designated region" for this environmental statement was defined by the Department as the coal-bearing portion of the northern Powder River basin within Montana, exclusive of the Crow and Northern Cheyenne Indian Reservations and the Crow ceded area. The reservations were excluded from the designated region because they come under different Federal responsibilities for minerals management.

In the fall of 1976, the State of Montana joined the U.S. Geological Survey in a cooperative agreement to produce this regional environmental statement and the three site-specific statements published with it. After preparation of the regional statement was begun, the Governor of the State of Montana requested an expansion of the regional boundaries northward to the Yellowstone River and westward to include the Sarpy Creek mining district and the Crow ceded area. The Department of the Interior agreed to an extension northward, but not westward to include any Indian lands or Indian-owned coal.

The regional statement identifies and assesses impacts from the development of coal within the designated region to 1990. Current permit applications for new coal mines and coal-fired electric generating units are examined in detail in separate site-specific environmental statements. These include applications for the Spring Creek mine (now approved--see FES 79-10), expansion of the Big Sky mine (FES 79-46), and the Pearl mine (volumes 2 and 4 of this FES). Applications for Colstrip generating units 3 and 4 and the associated transmission lines were examined in FES 79-29 prepared under the direction of the Bonneville Power Administration. Those applications are termed "proposed developments" and are emphasized in the regional analysis. After volume 1 was prepared, applications for both the Spring Creek mine and Colstrip units 3 and 4 were approved by State and Federal governments based, in part, on their respective site-specific environmental statements. For consistency, the term "proposed developments" is used in this volume to denote the three mines and the two power generating units.

Coal-related developments outside the designated region--on Indian lands and in Wyoming--are not examined in detail but are considered insofar as environmental impacts from them would add to impacts from the proposed developments. All environmental impacts from the proposed developments are addressed to the extent they are significant, even though the impacts may extend beyond the designated region. Thus, this statement addresses foreseeable impacts on the Crow and Northern Cheyenne Indian Reservations, the Crow ceded area, and portions of Wyoming that would result from new developments within the designated region of Montana.

c. Baseline conditions

In order to assess the regional impacts attributable to the several new mines within the designated region for which site-specific analyses were made, it was necessary to define "regional baseline conditions"--those conditions (coal production, population, etc.) that would exist even without implementation of the proposed developments.

There are two reasonable ways in which to define regional baseline conditions, both of which are arbitrary.

- 1) Conditions that existed at a certain time could be adopted as a static baseline.
- 2) Conditions that have been changing could be projected into the future based on current trends, company commitments, and anticipated new developments other than those being treated site-specifically.

The EIS task force chose the latter definition--a baseline that changes through time.

Figure I-2 on page I-4 of volume 1 shows the baseline regional coal production (in tons per year) projected to 1990. Additional combined production attributable to the Spring Creek mine (7 mty), the Big Sky mine expansion (4.2 mty), and the Pearl mine (2 mty) is shown separately on the graph. The fact that Spring Creek mine has been approved does not change the overall production expected from the region. The graph, figure I-2, and table I-2 (as well as other tables, graphs, and maps) could be changed to include the Spring Creek mine below the baseline rather than above it, or as existing rather than proposed.

The "intermediate level" of production, analyzed in this EIS, is the combined production of the carefully considered changing "baseline developments" plus the three new mines that were treated site-specifically. Table I-1 gives the expected annual coal production, between now and 1990, from both the designated region and adjacent areas at the intermediate (and most probable) level. Other published projections may not agree with those given here. For example, the Institute for Policy Research at the University of Wyoming projected a considerably higher rate of growth in Sheridan County, Wyoming, which is adjacent to the designated region.

Their projections included growth in economic sectors such as tourism --sectors held constant in this analysis to better focus on the effects of coal development. Conditions that could lead to low level or high level production rates are described in Chapter VIII.

d. Spring Creek mine

All references, including tables and figures, to the NERCO Spring Creek mine as being proposed instead of existing, are incorrect. The Spring Creek mine has been approved. Rather than change the text, the reader may simply transfer those portions of coal production, population growth, social and economic changes, etc., that were identified with the Spring Creek proposal to the existing environment. It is essentially a matter of semantics.

F. SUMMARY OF HEARINGS

1. Forsyth, Montana, August 22, 1979

a. Summary of comments by Ellen Quigley, Northern Cheyenne
Research Project, Lame Deer

Comment: Total sulfur dioxide emissions from the Colstrip generating units is many times less than the 23,700 tons/year listed on page II-43. Sulfur dioxide is not the most abundant pollutant as stated on page II-43; the table on page II-45 shows that nitrogen oxide emissions are 2-1/2 times as abundant as sulfur dioxide emissions.

Response: See responses 19C and 19D.

Comment: The Indians did not lose the Rosebud Creek battle as stated on page II-77. Fifty-seven whites died and four Indians died. It's one of their big victories.

Response: Volume I was in error in its statement regarding the Battle of Rosebud Creek. Other commenters (letters 10, 20, 30, and 32) were critical of the history section and submitted additional information, which is incorporated by reference. The major conclusions of the social environment section are not changed, however.

Comment: The Supreme Court did not award the Northern Cheyenne Tribe the right to cancel all existing mineral leases as stated on page II-103. The leases have only been suspended. Commenter asked the present state of the leases.

Response: See response 20I (letter from James P. Boggs).

Comment: Cumulative impacts are not addressed or are sparsely addressed. What will happen to future development in the area as specific projects take up increments of growth?

Response: The only "growth increments" that have legal definition are for air quality. See volume I, chapter VII, paragraph 5. Cumulative effects are addressed throughout chapters IV through VII. The emphasis in the summary statements on the proposed developments may have obscured the discussion of cumulative impacts.

b. J. R. Lee

J. R. Lee of Forsyth, Montana, entered several written documents into the hearing record pertaining to the problem of waterlogged hay fields due to heavy runoff in Armells Creek north of Colstrip. Those documents are reproduced as letter 26.

Response: See response to letter 26.

c. Patty Kluver

Patty Kluver of Forsyth submitted testimony concerning water quality in the well at her ranchhouse. Her testimony and attached documentation is reproduced as letter 25.

Response: See response to letter 25.

2. Sheridan, Wyoming, August 23, 1979

a. Robert Hamilton, NERCO

Robert Hamilton of Portland, Ore., entered into the hearing record a statement by William W. Lyons, of NERCO, Inc. That statement was also included in written comments (letter 29) submitted by NERCO after the hearing; therefore, responses appear with those comments.

b. Summary of comments by Tom Arrison, Powder River Basin Resource Council, Sheridan

Comment: The Northern Powder River Basin EIS and the Pearl Mine EIS fail to realize the seriousness of the financial situation in Sheridan, and they fail to make appropriate suggestions for alternatives and mitigating measures. There is serious doubt as to whether Sheridan can handle population increases due to mines in Montana, because Sheridan does not receive financial aid through local and State taxes that also come with the mines (that accrue to Montana).

Response: See response to letter 31 from the Powder River Basin Resource Council, especially responses 31Q through 31BB.

Comment: The EIS does not completely consider the North Decker Extension or the Sheridan Enterprises mine. The EIS specifically excludes new Federal leasing. In view of the current energy crisis, new Federal leasing is a probable option.

Response: The North Decker extension was analyzed in FES 77-20 (U.S. Department of the Interior and Montana Department of State Lands, 1977). Although no action has been taken, State and Federal regulatory agencies are continuing to assess the proposal. The Sheridan Enterprises mine is included in the regional production levels considered here, but it is beyond the scope of the regional EIS to cover any proposals in Wyoming in site-specific detail. Major new Federal coal leasing was specifically excluded from the analysis at the direction of the Secretary of the Interior.

Comment: The population scenarios used in the EIS assume that a new town near Decker and a powerplant in Sheridan County will alleviate impact in Sheridan. Evidence that such projects will be built is lacking.

Response: A new town called Spring Creek is being developed by Spring Creek Development, Limited. An EIS on the proposed town is being prepared by the Montana Department of Health and Environmental Sciences. The Big Horn County Commission has approved the master plan for the townsite and the first filing of the master plan platting. The Commission has also approved a county water and sewer district, pending a decision by Montana's Attorney General.

A new power generating plant in Sheridan County is assumed in the high level of coal development analyzed in chapter VIII. Plans for the plant are not as well developed as plans for the town of Spring Creek, so the plant is not included in the intermediate (most probable) level.

Comment: Sheridan County is at the limit of its ability to provide services for new growth.

Response: There are several methods by which Sheridan County could raise additional revenue. Wyoming has a joint powers law which would allow Sheridan-area governments and school districts that are below the constitutional mill levy limits to share their tax base with those that are at the limit, thereby pooling resources and reducing the disparity in mill levies. Wyoming law also allows for creation of special taxing districts (fire, sewer, cemetery) which could supplement the general fund. Sheridan County has also been designated an energy impacted area by joint action of the Governors of Wyoming and Montana under the FMHA (Farmers Home Administration) 601 program, partly because of the effect of mines in Montana on that county.

c. Summary of comments by Mary Paine, Director of Public Assistance and Social Services in Sheridan County

Comment: Information provided to EIS team was not accurately quoted, and name was not correct on page II-84. The statement that food stamp caseloads are not expected to increase was accurate at the time but is now out of date: there has been a 75-case increase in food stamps in 1979. Part of this has been brought about by people moving into the area looking for employment. A 10-member staff may not be able to deal with expected population increases. Social workers must, by law, investigate cases of abuse and neglect within 24 hours, which limits work on other problems.

Response: We apologize for misidentifying your name. It is not clear what information was misquoted. Your comment on food stamps and welfare caseloads is noted. Because of time needed for publishing, the document may not always contain the latest information.

d. Reed Zars, Powder River Basin Resource Council,
Sheridan

Comments made by Mr. Zars are also presented in letter 31 from the Powder River Basin Resource Council. Responses are found with that letter.

- e. Summary of comments by Michael Eidlin, Northern Energy Resources Company, Sheridan

Comment: Neither Spring Creek Coal Company nor its corporate parent, NERCO, has any involvement with the proposed new town of Spring Creek.

Response: The comment is correct. The proposed town is being developed by Spring Creek Development Limited. Spring Creek Coal Company is building a temporary facility for construction workers in Decker. All of the space is reserved for Spring Creek workers. The facility will be removed after construction, according to current plans.

CHAPTER X

REFERENCES

- Abshire, N. L., Derr, V. E., McNice, G. T., Pueschel, R. F., and VanValin, C. C., 1977, Integrated aerosol characterization monitoring, Colstrip, Montana: The bioenvironmental impact of a coal-fired power plant, Third Interim Report, Colstrip, Montana, December 1977, p. 295-324.
- Agee, E. M., 1971, An artificially induced local snowfall: American Meteorological Society Bulletin, v. 52, p. 557-560.
- Algermissen, S. T., and Perkins, D. M., 1977, Earthquake-hazard map of the United States: U.S. Geological Survey, Earthquake Information Bulletin, v. 9, no. 1, p. 21.
- Arnold, F. B., and Dollhopf, D. J., 1977, Soil water and solute movement in Montana strip mine spoils, v. 1 of a continuing study: Bozeman, Montana State University, Montana Agricultural Experiment Station, Research Report 106, 128 p.
- ARS-NDAES, 1977, Research on reclamation of strip-mined lands in the Northern Great Plains, Progress Report, 26 p.
- Auclair, D., 1976, Effects of dust on photosynthesis; I, Effects of cement and coal dust on photosynthesis of spruce: Annales des Sciences Forestieres, v. 33, p. 247-256.
- Beetle, A. A., 1960, A study of sagebrush; the section of tridentatae of Artemisia: University of Wyoming Agricultural Experiment Station, Bulletin 368, 83 p.
- Beckes, M. R., 1974, Preliminary archeological survey of Custer National Forest, southeastern Montana: Missoula, University of Montana.
- Bennett, J. H., and Hill, A. C., 1974, Acute inhibition of apparent photosynthesis by phytotoxic air pollutants: American Chemical Society Symposium Series no. 3, p. 115-127.
- Berg, R. B., Lawson, D. C., Jones, F. P., and Smith, R. I., 1970, Progress report on clays and shales of Montana, 1968-1969: Montana Bureau of Mines and Geology Bulletin 80, 27 p.
- _____, 1973, Progress report on clays and shales of Montana: Montana Bureau of Mines and Geology Bulletin 89, 18 p.
- Biscoe, P. V., Unsworth, M. H., and Pinckney, H. R., 1973, The effects of low concentrations of sulfur dioxide on stomatal behavior in Vicia faba: New Phytologist, v. 72, p. 1299-1306.
- Bolt, G. H., and Bruggenwert, M. G. M., 1976, Soil chemistry; A, basic elements: New York, Elsevier Publishing Co., 281 p.

- Boscak, Vladimir, and Tandon, J. S., 1974, Development of chemical for suppression of coal dust dispersion from storage piles: Presented at the Fourth Annual Environmental Engineering and Science Conference, University of Louisville, Louisville, Kentucky, March 4-5, 1974, 14 p.
- Botz, M. K., 1978 Characteristics and potential impact of wastewaters from a coal-fired power plant at Colstrip, Montana: Prepared by Westech for the Montana Department of Health and Environmental Sciences, Water Quality Bureau, 67 p.
- Bown, Thomas, and McGrew, P. O., 1977, Paleontological resources investigations of the Spring Creek area, p. 93-97, in Archeology, history, and paleontology, Spring Creek project environmental baseline studies: Northern Energy Resources Company, application for Spring Creek mining and reclamation permit.
- Brandt, C. J., and Rhoades, R. W., 1972, Effects of limestone dust accumulation on composition of a forest community: Environmental Pollution, v. 3, p. 217-225.
- _____, 1973, Effects of limestone dust accumulation on lateral growth of forest trees: Environmental Pollution, v. 4, p. 207-213.
- Bromenshenk, J. J., 1978, Honeybees and other insects as indicators of pollution impact from the Colstrip power plants, in The bioenvironmental impact of a coal-fired power plant: Environmental Studies Laboratory, University of Montana, Fourth Interim Report, December 1978, p. 75-99.
- Brown, Andrew, Culbertson, W. C., Dunhan, R. J., Kepferle, R. C., and May, R. R., 1954, Strippable coal in Custer and Powder River Counties, Montana: U.S. Geological Survey Bulletin 995-E, p. 151-199.
- Bryson, R. A., 1972, Climate modification by air pollution: Institute for Environmental Studies, University of Wisconsin, Report No. 1, p. 132-177.
- Buckman, H. O., and Brady, N. C., 1972, The nature and properties of soils: New York, The Macmillan Co., 653 p.
- Bury, R. L., Wendling, R. C., and McCool, S. F., 1976, Off-road recreation vehicles - A research summary, 1969-1975: Texas Agricultural Experiment Station Report MP-1277, 84 p.
- Centaur Management, 1978, Lower Yellowstone area socio-economic analysis: Open-file report prepared for Montana State Office, U.S. Bureau of Land Management, 350 p.
- Chaiken, R. F., Cook, E. B., and Ruhe, R. C., 1974, Toxic fumes from explosives, ammonium nitrate-fuel oil mixtures: Pittsburg, Pennsylvania, Pittsburg Mining and Safety Research Center, U.S. Bureau of Mines, Report on Investigations 7867, 24 p.

- Coffey, Marilyn, 1978, Dust storms; with biographical sketch: *Natural History*, v. 86, no. 4, p. 72-83.
- Constantinidou, H., Koslowski, T. T., and Jensen, K., 1976, Effects of sulfur dioxide on Pinus resinosa seedlings in the cotyledon stage: *Journal of Environmental Quality*, v. 5, p. 141-144.
- Dale, E. E., 1960, The range cattle industry--ranching on the Great Plains from 1865 to 1925: Norman, University of Oklahoma Press.
- Darley, E. F., 1966, Studies on the effect of cement-kiln dust on vegetation: *Journal of Air Pollution Control Association*, v. 16, p. 145-150.
- Davis, C. M., 1976, A preliminary archeological reconnaissance survey, Bureau of Land Management, southeastern Montana: Missoula, University of Montana.
- Dendy, F. E., and Champion, W. A., 1973, Summary of reservoir deposition surveys made in the United States through 1970: U.S. Agricultural Research Service, Miscellaneous Publications no. 1266, 82 p.
- Dennison, R., Caldwell, B., Bormann, B., Eldred, L., Swanberg, C., and Anderson, S., 1976, The effects of acid rain on nitrogen fixation in western Washington coniferous forests, in *Proceedings of the First International Symposium on Acid Precipitation and the Forest Ecosystem*, L. S. Dochinger and T. A. Siliga, eds.: p. 933-949.
- DePuit, E. J., Coenenberg, J. G., and Willmuth, W. H., 1978, Research on revegetation of surface mined lands at Colstrip, Montana: Bozeman, Montana State University, Montana Agricultural Experiment Station Program Report, 1975-77, 165 p.
- Dochinger, L. S., and Seliga, T. A., eds., 1976, *Proceedings of the First International Symposium on Acid Precipitation and the Forest Ecosystem*, May 12-13, 1976, Columbus, Ohio: U.S. Forest Service.
- Dollhopf, D. J., Hall, W. D., Schafer, W. M., DePuit, E. J., and Hodder, R. L., 1978, Selective placement of coal strip mine overburden in Montana: Bozeman, Montana State University, Montana Agricultural Experiment Station Research Report 128, 109 p.
- Dollhopf, D. J., Goering, J. D., Levine, C. J., Bauman, B. J., Hedberg, D. W., and Hodder, R. L., 1978, Selective placement of coal strip-mine overburden in Montana; III, spoil mixing phenomena: Bozeman, Montana State University, Agricultural Experiment Station Research Report 135, 68 p.
- Dunrud, R. C., and Osterwald, F. W., 1978, Effects of coal mine subsidence in the western Powder River Basin, Wyoming: U.S. Geological Survey Open-File Report 78-473, 71 p.

- Ebens, R. J., and McNeal, J. M., 1977, Geochemistry of Fort Union shale and sandstone in outcrop in the Northern Great Plains coal province; in Geochemical Survey of the Western Energy Regions: U.S. Geological Survey Open-File Report 77-872, p. 185-197.
- Ecological Consulting Service (ECON), 1976a, Annual small mammal and vegetation report: Peabody Coal Company, Big Sky mine, Progress Report, Project no. 131-83-A, 45 p., appendixes.
- _____, 1976b, Report on the annual wildlife monitoring studies for 1976 and the habitat diversity and utilization analysis for the period 1973-1976: Peabody Coal Company, Big Sky mine, Project no. 130-85-A, 68 p., appendixes.
- EG & G Environmental Consultants, 1976, Summary report, CIRL Air Monitoring Program, October 2, 1975, to October 2, 1976: Prepared for Shell Oil Company Mining Ventures, December 1976.
- Elliot, M. A., and Davis, R. F., 1950, Composition of diesel exhaust gas: J. A. E. Quarterly Transactions, v. 4, p. 330-346.
- Ellison, Lincoln, and Woolfolk, E. J., 1937, Effects of drought on vegetation near Miles City, Montana: Ecology, v. 18, p. 329-336.
- Employment Security Commission of Wyoming, 1971-78, Wyoming labor force trends: Cheyenne, Wyoming, v. 8-15, no. 1.
- _____, 1978, Wyoming labor force trends: Cheyenne, Wyoming, v. 15, no. 9, p. 2, 12.
- EVST Laboratory, 1977, Determination of the acidity of precipitation samples collected at sites in the vicinity of Colstrip I and II: EVST Report, 6 p.
- _____, 1978, Colstrip Units 3 and 4: Emissions, vegetation and animal impacts, and possible fumigation episodes: Working paper prepared for Texas Instruments.
- Erdman, J. A., Eben, R. J., and Case, A. A., 1978, Molybdenosis--A potential problem in ruminants grazing on coal mine spoils: Journal of Range Management, v. 31, no. 1, p. 34-36.
- Eriksson, J., Hakansson, I., and Danfors, B., 1974, The effect of soil compaction on soil structure and crop yields: (Translated in 1975 from Swedish): Swedish Institute of Agricultural Engineering Bulletin 354, 101 p.
- Euler, R. C., Gumerman, G. J., Karlstrom, T. N. V., Dean, J. S., and Hevly, R. H., 1979, The Colorado Plateaus--Cultural dynamics and paleoenvironment: Science, v. 205, no. 4411, p. 1089-1101.

- Fenneman, N. M., 1931, Physiography of Western United States: New York, McGraw-Hill Book Co., 534 p.
- Fitzsimmons, S. J., Stuart, L. I., Wolff, P. C., 1977, Social assessment manual--A guide to preparation of the social well-being account for planning water resource projects: Boulder, Colorado, Westview Press, 289 p.
- Fredlund, D. E., 1972, Archeological survey, Western Energy Company lands, Rosebud County, Montana: Missoula, Montana, University of Montana, statewide survey.
- Gee, G. W., Bauer, Armand, and Decker, R. S., 1978, Physical analyses of overburden materials and mine land soils, in Schaller, F. W., and Sutton, Paul, eds., Reclamation of drastically disturbed lands: American Society of Agronomy, Crop Science Society of America, and Soil Science Society of America, Madison, Wisconsin, p. 665-685.
- Gelhaus, J. W., 1976, An air quality assessment of Colstrip, Montana, prior to development of coal-fired power plants: Montana Department of Health and Environmental Sciences, Air Quality Bureau, 90 p.
- Gilbert, O. L., 1976, An alkaline dust effect on epiphytic lichens: Lichenologist, v. 8, p. 173-178.
- Gilley, J. E., Gee, G. W., Willis, W. O., and Young, R. A., 1976, Water infiltration at surface mined sites in western North Dakota: North Dakota Farm Research, v. 34, p. 34-34.
- Gilmore, John, 1976, Boomtowns may hinder energy resources development: Science, v. 191, p. 535-540.
- Gilmore, J. S., and Duff, M. K., 1975, Boomtown growth management--A case study of Rock Springs and Green River, Wyoming: Boulder, Colorado, Westview Press, 177 p.
- Gold, R. L., 1974a, A comparative case study of the impact of coal development on the way of life of people in the coal areas of eastern Montana and northeastern Wyoming: Missoula, Final Report, Institute for Social Research, University of Montana (for Northern Great Plains Resource Program), 185 p.
- _____, 1974b, A social impact study of Colstrip generating plants Nos. 3 and 4--Summary of interview data: Missoula Institute for Social Research, University of Montana (for Montana Department of Natural Resources and Conservation and Montana State Social and Rehabilitation Services), 166 p.

- _____, 1975, A study of social impact of coal development in the Decker-Birney-Ashland area: Missoula, Final Report Institute for Social Research, University of Montana (for Montana Energy Advisory Council), 76 p.
- Gordon, C. C., and Tourangeau, P. C., 1975. Conifer tree damage in the vicinity of large stationary sources of phytotoxic gases--Mount Storm, West Virginia and other areas of the U.S.: Air Pollution Control Association Paper No. 75-21.1, 38 p.
- Gordon, C. C., Tourangeau, P. C., and Rice, P. M., 1978, Foliar pathologies of ponderosa pine near Colstrip, in The bioenvironmental impact of a coal-fired power plant: Environmental Studies Laboratory, University of Montana, Missoula, Fourth Interim Report, December 1978, p. 1-74.
- Gregg, M., 1977, Archeological survey of the Pearl area, prepared for Shell Oil Company by the Division of Archeology and Cultural Resources, Montana Tech Alumni Foundation, Butte, Montana.
- Grim, E. C., and Hill, R. D., 1974, Environmental Protection in Surface Mining of Coal, Office of Research and Development, Cincinnati, Ohio, U.S. EPA Program Element No. 1BB040, 277 p.
- Guarnaschelli, Claudia, 1977, In-transit control of coal dust from unit trains: Environmental Protection Service, Fisheries and Environment Canada, Report No. EPS 4-PR-77-1, 54 p.
- Guderian, R., 1977, Air pollution; phytotoxicity of acid gases and its significance: New York, Springer Verlag (C. J. Brandt, trans.), 127 p.
- Haberman, T. W., 1973, 1972 archaeological survey in the Decker/Birney area of Big Horn County, southeastern Montana: A Western Interstate Commission for Higher Education Project, Boulder, Colorado; sponsored by the Bureau of Land Management, Billings, Montana, 105 p.
- Hadley, R. F., and Schumm, S. A., 1961, Sediment sources and drainage basin characteristics in upper Cheyenne River basin: U.S. Geological Survey Water-Supply Paper 1531-B, p. 137-196.
- Haines, Francis, 1971, Horses in America: New York, Thomas Y. Crowell Co.
- Hinkley, T. K., and Ebens, R. J., 1976, Mineralogy of fine-grained rocks in the Fort Union Formation, in Geochemical Survey of the Western Energy Regions, Third Annual Progress Report: U.S. Geological Survey Open-File Report 76-729, p. 10-13.
- _____, 1977, Geochemistry of fine-grained rocks in cores of the Fort Union Formation, Northern Great Plains, in Geochemical Survey of the Western Energy Regions, Fourth Annual Progress Report: U.S. Geological Survey Open-File Report 77-872, p. 169-172.

- Hinkley, T. K., Ebens, R. J., and Boerngen, J. G., 1978, Overburden chemistry and mineralogy at Hanging Woman Creek, Big Horn County, Montana, and recommendations for sampling at similar sites: U.S. Geological Survey Open-File Report 78-393, 59 p.
- Hitchcock, C. L., Cronquist, A., Ownby, M., and Thompson, J. W., 1961, Vascular plants of the Pacific Northwest: Seattle, University of Washington Press.
- Hobbes, P. V., Harrison, H., and Robinson, E., 1974, Atmospheric effects of pollutants: Science, v. 184, p. 909-915.
- Hodson, W. G., Pearl, R. H., and Druse, S. A., 1973, Water resources of the Powder River Basin and adjacent areas, northeastern Wyoming: U.S. Geological Survey, Hydrologic Investigations Atlas HA-465.
- Holzworth, G. C., 1972, Mixing heights, wind speeds, and potential for urban air pollution throughout the contiguous United States: U.S. EPA, January 1972, Office of Air Programs, 118 p.
- Hutcheson, M. R., and Hall, F. P., Jr., 1974, Sulfate washout from a coal fired power plant plume: Atmospheric Environment, v. 8, p. 23-28.
- Jenkins, D. A., and Davies, R. I., 1966, Trace element content of organic accumulations: Nature, v. 210, p. 1296-1297.
- Jobes, P. C., and Parsons, M. G., 1975, Satisfaction, coal development and land-use planning--A report of attitudes held by residents of the Decker-Birney study area: Bozeman, Montana State University (submitted to the Montana Energy Advisory Council), 287 p.
- Johnson, M. C., and White, R. V., 1975, Colstrip, Montana; the fiscal effects of recent coal development and an evaluation of the community's ability to handle further expansion: Unpublished report for the Department of Interior, Office of Mineral Policy Development, 76 p.
- Klingebiel, A. A., and Montgomery, P. H., 1961, Land capability classification: U.S. Department of Agriculture, Agricultural Handbook 210, 21 p.
- Kranzel, C. F., and McDonald, F. H., 1971, Social forces in rural communities of sparsely-populated areas. Montana State University, Agricultural Experiment Station, Bulletin 647, 17 p.
- Larson, T. A., 1966, History of Wyoming: Lincoln, University of Nebraska Press.
- LASA, 1978, Final report of data and conclusions for aerosol measurements model, October 3-6, 1978, at Western Energy mines, Colstrip, Montana: October 16, 1978, 7 p.

- Lewis, B. D., and Roberts, R. S., 1978, Geology and water-yielding characteristics of rocks of the northern Powder River basin, southeastern Montana: U.S. Geological Survey, Miscellaneous Investigations Series, Map I-847-D.
- Li, Ta-Yung, and Landsburg, H. E., 1978, Rainwater pH close to a major power plant: Atmospheric Environment, v. 9, p. 81-88.
- Liang, C. N., and Tabatabai, M. A., 1978, Effects of trace elements on nitrification in soils: Journal of Environmental Quality, v. 7, p. 291-293.
- Lomasson, Thomas, 1947, Influence of rainfall on the prosperity of eastern Montana, 1878 to 1946, in Developments in range management: Missoula, Montana, U.S. Forest Service, Region I, no. 7, April 1947, 1 p.
- Lowie, R. H., 1935, The Crow Indians: New York, Farrar and Rinehart, Inc.
- Lowie, Robert, 1954, Indians of the Plains: New York, McGraw-Hill.
- Lusby, G. C., and Toy, T. J., 1976, An evaluation of surface-mine spoils area restoration in Wyoming using rainfall simulation: Earth Surface Processes, v. 1, p. 375-386.
- Magill, E. A., Hubbard, C. R., and Stinson, D. L., 1967, Mineral resources and their potential on Indian lands, Northern Cheyenne Reservation, Big Horn and Rosebud Counties, Montana: U.S. Bureau of Mines preliminary report 170.
- Malde, H. E., and Boyles, J. M., 1976, Maps of alluvial valley floors and strippable coal in forty-two 7 1/2-minute quadrangles, Big Horn, Rosebud, and Powder River Counties, Southeast Montana: U.S. Geological Survey Open-File Report 76-162, 49 p.
- Mapel, W. J., and others, 1977, Summary of the geology, mineral resources, environmental geochemistry, and engineering geologic characteristics of the northern Powder River coal region, Montana: U.S. Geological Survey Open-file Report 77-291.
- Marsh, A. R. W., 1978, Sulfur and nitrogen contributions to the acidity of rain: Atmospheric Environment, v. 12, p. 401-406.
- Massey, Garth, 1977, Newcomers in an impacted area of Wyoming: Laramie, University of Wyoming, Department of Sociology and Center for Urban and Regional Analysis, 126 p., appendixes.

1978, Building a power plant; newcomers and social impact: prepared under a grant from the National Institute of Mental Health, Final Report, Laramie, University of Wyoming, 105 p., appendixes.
- Matson, R. E., 1975, Description of seams, Montana, in 1975 Keystone coal industry manual: McGraw Hill, Inc., New York, p. 577-584.

- Matson, R. E., and Blumer, J. W., 1973, Quality and reserves of strip-pable coal, selected deposits, southeastern Montana; Analytical data by L. A. Wegelin: Montana Bureau of Mines and Geology bulletin 91, 135 p., 34 pl.
- McAllister, D. C., Ruby, M., and Vichorek, D., 1979, Draft environmental impact statement, Montana ambient air quality standards study: Montana Department of Health and Environmental Sciences, Air Quality Bureau, January 3, 1979, 277 p.
- McLean, G. A., 1975, An archeological survey of the Ashland District, Custer National Forest: Missoula, University of Montana.
- McQuiston, J. M., 1978, Regression analysis and summary of the impact of mining industry on Big Horn, Custer, Powder River, Rosebud, Sheridan, and Treasure Counties: Missoula, Montana, Final unpublished report submitted to NPRB EIS Task Force, 42 p.
- _____, 1979, The impact of coal development on the northern Powder River county social services: Missoula, Montana, Unpublished report submitted to the NPRB EIS Task Force.
- Meadowlark Group, 1978a, Socio-economic study of the proposed Shell Oil Company Pearl mine: Report prepared for the Montana Department of State Lands, Helena, Montana, 390 p.
- _____, 1978b, Report to the Department of State Lands on the economic impact of the Big Sky mine expansion: Helena, Montana, 263 p.
- Merton, R. K., 1968, Social theory and social structure, enlarged ed.: New York, New York Free Press, 702 p.
- Mikol, S. A., 1977, Distribution and abundance of breeding birds on surface-mineable coal lands in the northern Great Plains: Department of Wildlife Ecology, University of Wisconsin, Madison, Progress Report, 73 p.
- Miller, J. F., Frederick, R. H. , and Tracey, R. J., 1973, Precipitation frequency atlas of the western United States: see U.S. Department of Commerce, 1973.
- Missouri River Basin Commission, 1978, Report on the Yellowstone basin and adjacent coal area, Level B Study, Tongue and Powder, Montana, May 1978: p. II-22.
- Montana Department of Fish and Game, 1976 (Draft), Statewide comprehensive outdoor recreation plan (SCORP); (1978, Final) v. 1, A strategic plan for the protection, perpetuation, and use of Montana's wildlife, fish and recreation resources; v. 2, Outdoor recreation inventory: Helena, Montana.

Montana Department of Highways, 1976, Montana's highway needs related to hauling energy resources and other energy induced needs: Planning and Research Bureau Report, Helena.

____ 1977, 1977 Montana primary highway sufficiency ratings: Planning and Research Bureau, Helena, Prepared in cooperation with the U.S. Department of Transportation and the Federal Highway Administration, 188 p.

____ 1978, Tentative construction program, fiscal year 1978 through 1983: Planning and Research Bureau Report, Helena, May 1, 1978.

Montana Department of Labor and Industry, 1971-78, Montana employment and labor force: Helena, Montana, monthly report, vs. 1-8.

____ 1974, Montana manpower, projected Montana employment by industry and selected occupations, 1970-78: Helena, Montana, Montana State Employment Service, September 1974, 56 p.

____ 1977, Montana employment and labor force: Helena, Montana, monthly report, v. 17, no. 7, July 1977.

____ 1978, Montana employment and labor force: Helena, Montana, monthly report, v. 8, no. 10, October 1978.

Montana Department of Natural Resources and Conservation (DNRC), 1974, Draft environmental impact statement on Colstrip electric generating units 3 and 4, 500-kilovolt transmission lines and associated facilities, November 1974.

____ 1976, Yellowstone River Basin; draft environmental impact statement for water reservation applications: Helena, Montana, v. 1, 217 p.; v. 2, 413 p.

Montana Department of Revenue, 1945-76, Report of the State Department of Revenue, various volumes during the period 1945-76.

____ 1977, Report of the State Department of Revenue, for the period July 1, 1974 to June 30, 1976, Helena, Montana, 130 p.

Montana Department of State Lands, 1977, Final environmental impact statement for the proposed expansion of Western Energy Company's Rosebud mine into areas A and E: v. II, Appendices, September 6, 1977, p. A-4, A-5.

Montana Power Company, 1977, Colstrip fact sheet (pamphlet).

Montana State University, Agricultural Experiment Station, 1954, Montana population changes, 1920-50.

Morgan, Thomas, 1966, History of coal mining in Montana, from the proceedings of the first Montana coal resources symposium, special publication 36 of the Montana Bureau of Mines and Geology, March 1966, 89 p.

- Mountain West Research, Inc., 1975, Construction worker profile--Community report, Forsyth and Colstrip, Montana: A Study for the Old West Regional Commission, December, 1975.
- Munn, R. E., 1966, Descriptive micrometeorology: New York, Academic Press, 245 p.
- Murray, F. X., ed., 1978, Where we agree: report of the National Coal Policy Project, v. II.
- Nalco Environmental Sciences, 1977, Short-term high volume sampling along Burlington Northern Railroad right-of-way, August 24-25, 1977: Lincoln, Nebraska, Report to Lincoln/Lancaster County, Railroad Transportation Safety District, September 21, 1977, Project No. 5501-08871, 13 p.
- National Academy of Sciences, 1974, Rehabilitation potential of Western coal lands--A report to the Energy Policy Project of the Ford Foundation: Cambridge, Massachusetts, Ballinger Publishing Co., 198 p.
- National Institute of Mental Health (NIMH), 1977, Mental health of rural America, 180 p.
- Nichols, T. C., Jr., and Chleborad, A. F., 1977, A preliminary basis for prediction of natural slope stability, in Mapel, W. J., and others, Summary of the geology, mineral resources, environmental geochemistry, and engineering geologic characteristics of the northern Powder River coal region, Montana: U.S. Geological Survey Open-file Report 77-291.
- Nimerick, K. H., and Laflin, G. P., 1977, Intransit wind erosion losses of coal and method of control: Paper presented at the SME fall meeting and exhibit, October 19-21, St. Louis, Missouri, 15 p.
- Northern Cheyenne Tribe, 1976, The Northern Cheyenne air quality redesignation report and request: Prepared by the Northern Cheyenne Research Project, Richard Monteau, Coordinator, under the direction of the Northern Cheyenne Tribe, Allen Rowland, President, Northern Cheyenne Tribal Council.
- Northern Great Plains Resource Program, 1974, Atmospheric aspects work group report: Discussion draft, December 1974, 428 p.
- Oliver, W. W., 1957, The Spotted Horse coal field, Sheridan and Campbell Counties, Wyoming: U.S. Geological Survey Bulletin 1050, 82 p.
- Oliver, J. E., 1973, Climate and Man's Environment: New York, John Wiley and Sons.
- Olson, G. R., 1973, Range conditions on abandoned cropland in north-central Montana: Missoula, University of Montana, unpublished M.S. thesis.

- O'Toole, J. J., Gordon, C. C., Rancitelli, L. A., Munshower, F. F., Perkins, R. W., Crecelius, E. A., and Tourangeau, P. C., 1977, Potential of energy extraction processes in the northern Great Plains for heavy metal contamination and consequent uptake and turnover in a range ecosystem model: Ames Laboratory, Iowa State University, Quarterly Report, July 1977, 15 p., tables.
- Osgood, E. S., 1929, The day of the cattleman: Minneapolis, University of Minnesota Press.
- Osterwald, F. W., and others, 1977, Engineering geologic characteristics, in Mapel, W. J., and others, Summary of the geology, mineral resources, environmental geochemistry, and engineering geologic characteristics of the northern Powder River coal region, Montana: U.S. Geological Survey Open-file Report 77-291.
- Paulson, L. E., Cooley, S. A., Wegert, C., and Ellman, R. C., 1976, Experiences in transportation of dried low-rank western coals: Society of Mining Engineers, AIME, Transactions, v. 260, p. 300-305.
- PEDCo-Environmental, Inc., 1977, Southeastern Montana coal resource AQMA analysis: Prepared for the U.S. Environmental Protection Agency, Region 8, under Contract no. 68-02-1375, Denver, Colorado, 48 p.
- _____, 1978, Survey of fugitive dust from coal mines: Prepared for the U.S. Environmental Protection Agency, EPA 908.178003, 115 p.
- Perera, F. P., and Karim Ahmed, A., 1978, Respirable particles--impact of airborne fine particulates on health and the environment: Report of the Natural Resources Defense Council, 252 p.
- Payne, G. F., 1973, Vegetative rangeland types in Montana: Bozeman, Montana Agricultural Experiment Station, Bulletin 671, 16 p.
- Poon, L. C. L., 1978, Railway externalities and residential property prices: Land Economics, v. 54, p. 218-227.
- Proctor, J., and Woodwell, S. R., 1975, The ecology of serpentine soils: Advances in Ecological Research, v. 9, p. 255-366.
- Pueschel, R. F. and VanValin, C. C., 1976, Cloud nuclei formation in the plume of a coal-fired power plant: American Geophysical Union Transactions, v. 57, p. 925.
- Quimby, D. C., 1966, A review of literature relating to the effects and possible effects of sagebrush control on certain game species in Montana: 46th Annual Conference of Western Association State Game & Fish Commissioners, 13 p.
- Rahn, P. H., 1976, Potential of coal strip-mine spoils as aquifers in the Powder River Basin: Billings, Montana, Report prepared for the Old West Regional Commission, Project 10470025, 108 p.

- Rao, D. H., 1971, A study of the air pollution problem due to coal unloading in Varanosi, India: Proceedings, Second International Clean Air Congress, Washington, D.C., 1970, H. M. England and W. T. Beery, eds.: New York, New York Academic Press, 354 p.
- Renne, D. S., and Elliott, D. L., 1976, Regional air quality assessment for probable near-term coal-related energy development in the north-west: Richland, Washington, Battelle Pacific Northwest Laboratories, October 1976, 38 p.
- Robinson, R. J., 1977, Associate Fiscal Analyst of the Coal impact and Coal board grants: State of Montana Office of the Legislative Fiscal Analyst, unpublished report to the Legislative Finance Committee, 29 p.
- Sandoval, F. M., Bond, J. J., Power, J. F., and Willis, W. O., 1973, Lignite mine spoils in the Northern Great Plains--Characteristics and potential for reclamation, in M. K. Wali, ed., Some environmental aspects of strip mining in North Dakota: North Dakota Geological Survey Educational Series 5, p. 1-24.
- Sandoval, F. M., and Gould, W. L., 1978, Improvement of saline- and sodium-affected disturbed lands, in Schaller, F. W., and Sutton, Paul, eds., Reclamation of drastically disturbed lands: American Society of Agronomy, Crop Science Society of America, and Soil Science Society of America, Madison, Wisconsin, p. 485-502.
- Sandoval, F. M., Power, J. F., and Ries, R. E., 1978, Sodium migration upward on reclaimed sodic mine spoils: Bozeman, Montana, presented in Western Soil Science Society meeting, July 17-20, 1978.
- Schafer, W. M., Nielson, G. A., Dollhopf, G. A., and Temple, K., 1978, Soil genesis hydrological properties, root characteristics, and microbial activity of 1 to 50 year-old stripmine spoils: Bozeman, Montana, Montana Agricultural Experiment Station, Montana State University, 209 p.
- Schaller, F. W., and Sutton, Paul, eds., 1978, Reclamation of drastically disturbed lands: Madison, Wisconsin, American Society of Agronomy, Crop Science Society of America, and Soil Science Society of America, 742 p.
- Sheridan, R. P., and Rosenstreter, R., 1973, The effect of hydrogen ion concentrations in simulated rain on the moss Tortula ruralis (Hedw.) Sm.: The Bryologist, v. 76, no. 1, p. 168-173.
- Sherman, G. D., Schultz, F., and Alway, F. J., 1962, Dolomitization in soils of the Red River valley, Minnesota: Soil Science, v. 94, p. 304-313.

Sindelar, B. W., and Plantenberg, P. L., 1978, Establishment, succession, and stability of vegetation on surface mined lands in eastern Montana, annual progress report: Bozeman, Mont., Montana Agricultural Experiment Station, Montana State University, 211 p.

1979, Establishment, succession, and stability of vegetation on surface mined lands in eastern Montana, annual progress report: Bozeman, Mont., Montana Agricultural Experiment Station, Montana State University, 55 p.

Small, K. A., 1975, Air pollution and property values--Further comment: Review of Economics and Statistics, v. 57, p. 105-107.

Super, A. B., Heimbach, J. A., and McPartland, J. T., 1973, Air pollution potential determination program for Colstrip, Montana: Bozeman, Montana, Department of Earth Sciences, Montana State University, April 1973, 108 p.

Temple, G. S., 1978, A dynamic economic systems community impact model applied to coal development in the Northern Great Plains: Bozeman, Montana, Department of Agricultural Economics and Economics, Montana State University, in cooperation with the Economic, Statistics, and Cooperative Service, U.S. Department of Agriculture and Office of Research and Development, U.S. Environmental Protection Agency, Washington, D.C., prepared for partial fulfillment of EPA contract EPA-IAG-D8-E766, 142 p.

Thompson, L. S., 1977, The taxation and revenue system of State and local government in Wyoming as of 1976: Bozeman, Montana State University, Department of Agricultural Economics and Economics, in cooperation with Economic Research Service, U.S. Dept. of Agriculture and Office of Research and Development, U.S. Environmental Protection Agency, prepared for partial fulfillment of EPA contract EPA-IAG-D6-E766, 58 p.

Thompson, James, and others, 1978, Report on the impact of strip mining on Sheridan County, Wyoming: Laramie, Wyoming, Center for Urban and Regional analysis, University of Wyoming, unpublished report, 153 p.

Thornthwaite, C. W., 1931, The climates of North America according to a new classification: The Geographical Review, v. 21, p. 633-654.

Toole, K. R., 1976, The rape of the Great Plains--Northwest America, cattle and coal: Boston, Massachusetts, Little, Brown and Company, 271 p.

1977, Twentieth century Montana, a state of extremes: Norman, University of Oklahoma Press.

Unsworth, M. H., Biscoe, P. V., and Pinckney, H. R., 1972, Stomatal response to sulfur dioxide: *Nature*, v. 239, p. 458-459.

U.S. Bureau of Reclamation, 1971, North central power study: 2 v.

U.S. Community Services Administration, 1975, Special poverty statistics for CSA (OEO) from the 1970 census of 1969 incomes: unpublished, Washington, D.C.

U.S. Department of Agriculture, 1971, Soil survey--Powder River area, Montana: 99 p. and maps.

_____, 1975, Soil taxonomy--A basic system of soil classification for making and interpreting soil surveys: *Agricultural Handbook* 436, 754 p.

_____, 1978, Soil survey of Big Horn County area, Montana: 233 p. and maps.

U.S. Department of Commerce, 1971, Climatological summary, 1941-70, Station Colstrip, Montana: *Climatology of the United States*, No. 20-24.

_____, 1972, Employment by type and broad industrial sources, 1970, full and part-time wage and salary employment plus number of proprietors: Bureau of Economic Analysis, Regional Economic Information System, unpublished data from table 25.00, Washington, D.C.

_____, 1973, Precipitation-frequency atlas of the Western United States: National Oceanic and Atmospheric Administration (NOAA), Atlas 2, v. 1, Montana.

_____, 1974, 1972 Census of retail trade, area statistics: Bureau of Census, U.S. Government Printing Office, Washington, D.C., Montana RC72-A-27, 43 p.

_____, 1975, Regional employment by industry, 1940-70: Bureau of Economic Analysis, 542 p.

_____, 1977, Employment by type and broad industrial sources, 1971-75, full and part-time wage and salary employment plus number of proprietors: Bureau of Economic Analysis, Regional Economic Information System, unpublished data from table 25.00, Washington, D.C.

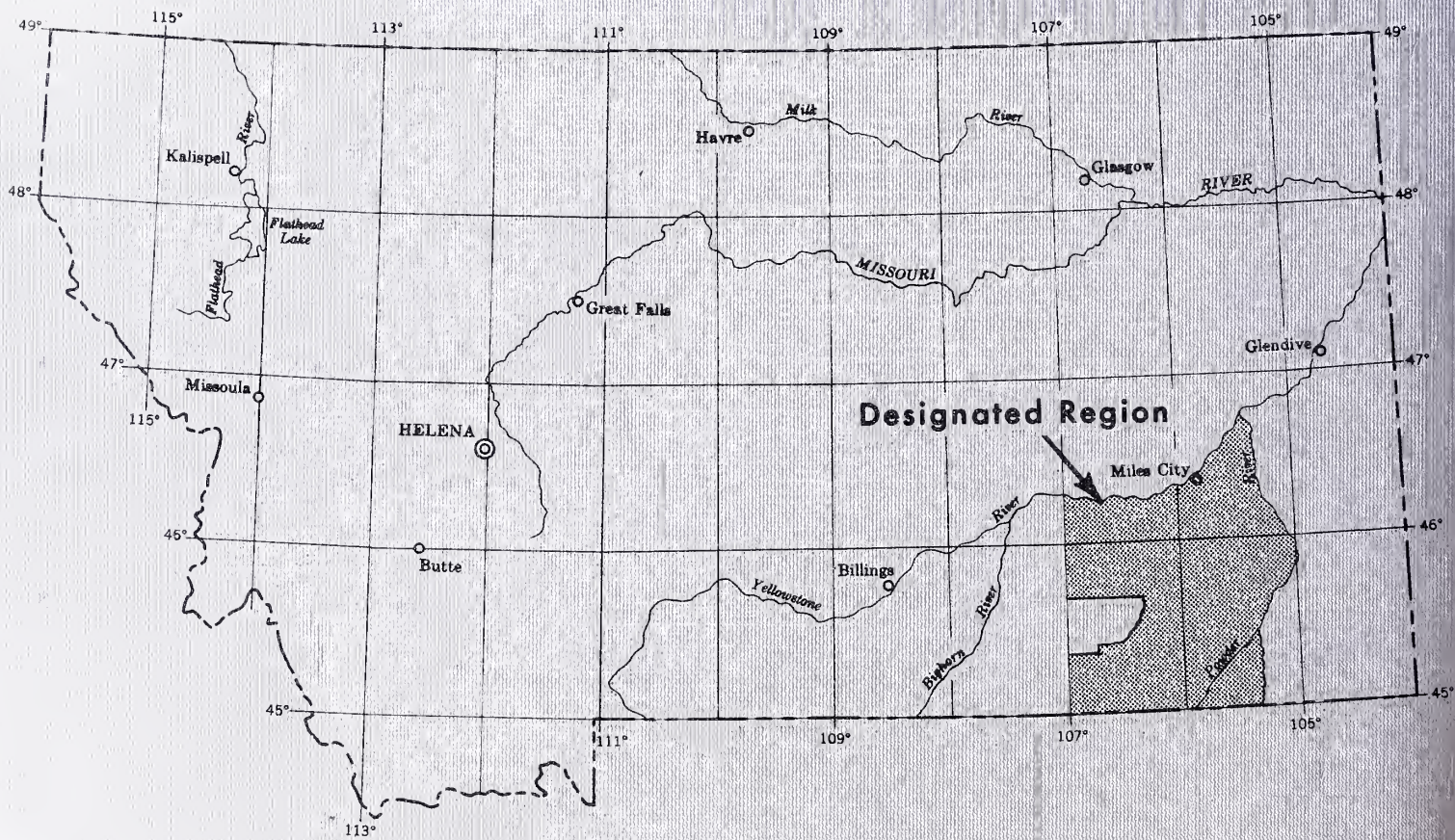
U.S. Department of Housing and Urban Development (HUD), 1976, Rapid growth from energy projects, 59 p.

U.S. Department of the Interior, 1970-78, Report of labor force: Bureau of Indian Affairs, Planning and support group annual report, form 5-2119, unpublished.

- ____ 1975, Resource and potential reclamation evaluation, Otter Creek study site: EMRIA Report No. 1, 200 p.
- ____ 1976a, Water resources data for Montana, water year 1976: U.S. Geological Survey Water-data Report MT-76-1, prepared in cooperation with the State of Montana and other agencies, 766 p.
- ____ 1976b, Water resources data for Wyoming, water year 1976; vol. 1, Missouri River Basin: U.S. Geological Survey Water-data Report WY-76-1, prepared in cooperation with the State of Wyoming and other agencies, 631 p.
- ____ 1977a, Resource and potential reclamation evaluation Bear Creek area--West Moorhead coalfield: EMRIA Report No. 8, 148 p.
- ____ 1977b, Water resources data for Montana water year 1977: U.S. Geological Survey Water-data Report MT-77-1, prepared in cooperation with the State of Montana and other agencies, 751 p.
- ____ 1977c, Water resources data for Wyoming, water year 1977; volume 1, Missouri River Basin: U.S. Geological Survey Water-data Report WY-77-2, prepared in cooperation with the State of Wyoming and other agencies, 615 p.
- U.S. Department of the Interior (USDI) and the Montana Department of State Lands (MDSL), 1977, Proposed plan of mining and reclamation, East Decker and North Extension mines, Decker Coal Company, Big Horn County, Montana: Final Environmental Statement FES 77-20, v. 1, 871 p.; v. 2, Appendixes.
- ____ 1979, Proposed mining and reclamation plan, Spring Creek mine, Big Horn County, Montana: Final Environmental Statement FES 79-10, 383 p.
- U.S. Department of the Interior, Bureau of Mines, 1932, Analysis of Montana coals: U.S. Bureau of Mines Technical Paper 529, 129 p.
- U.S. Department of the Interior, Fish and Wildlife Service (FWS), Division of animal damage control records, Billings, Montana.
- U.S. Energy Research and Development Administration (ERDA), 1977, Synthetic liquid fuels development: Assessment of critical factors, v. 3, 230 p.
- U.S. EPA, 1973, National Air Monitoring Program, Air quality and emission trends, annual report: v. 2., August 1973, EPA 450/1-73-001.
- ____ 1976a, Compilation of air pollutant emission factors, 2d ed.: AP-42, Part B, February 1976.
- ____ 1976b, Levels of trace elements in the ambient air at selected locations in the Northern Great Plains: Region VIII, EPA Contract No. 68-02-1383, Task 7, September 1976, 35 p.

- ____ 1977, Growth management for small communities, Sheridan, Wyoming: Boulder, Colorado Action Handbook, Prepared for the U.S. Environmental Protection Agency by Briscoe-Maphis, Inc., 86 p.
- [U.S.] Office of Management and Budget, 1979, Catalog of Federal domestic assistance: 1,003 p.
- University of Wyoming, 1977, Weather modification potential of coal-fired power plants: Prepared for the Old West Regional Commission, 138 p.
- URS, 1976, Coal train assessments, Final report, December 15, 1976, p. V-16.
- VanValin, C. C., and Pueschel, R. F., 1977, Atmospheric aerosol observations at Colstrip, Montana: Boulder, Colorado, Atmospheric Physics and Chemistry Laboratory, NOAA, ERL, 4 p.
- Van Voast, W. A., 1974, Hydrologic effects of strip coal mining in southeastern Montana--Emphasis, 1 year of mining near Decker: Montana Bureau of Mines and Geology, Bulletin 93, 24 p.
- Van Voast, W. A., and Hedges, R. B., 1974, Hydrology of Western Energy Company's probable mine area near Colstrip, southeastern Montana: Montana Bureau of Mines and Geology, Open-File Report, 31 p.
- ____ 1975, Hydrologic aspects of existing and proposed strip coal mines near Decker, southeastern Montana: Montana Bureau of Mines and Geology, Bulletin 97, 31 p.
- Van Voast, W. A., Hedges, R. B., and Pagenkopf, G. K., 1975, Hydrologic impacts of coal-mine effluents and spoils leachates, in Fort Union Coal Field Symposium: Billings, Mont., Montana Academy of Sciences Proceedings, v. 3, p. 289-303.
- Van Voast, W. A., Hedges, R. B., and McDermott, J. J., 1976, Hydrologic aspects of strip mining in the subbituminous coal fields of Montana, in Fourth Symposium on Surface Mining and Reclamation, Proceedings, Louisville, Kentucky: Washington, D.C., National Coal Association, p. 160-172.
- ____ 1977, Hydrogeologic conditions and projections related to mining near Colstrip, southeastern Montana: Montana Bureau of Mines and Geology, Bulletin 102, 43 p., 7 plates.
- ____ 1978, Hydrologic characteristics of coal mine spoils, southeastern Montana: Bozeman, Montana University Joint Water Resources Research Center, Report 94, 34 p.
- Webb, W. P., 1931, The Great Plains: New York, Grosset and Dunlap, 525 p.
- Weist, Tom, 1977, A history of the Cheyenne people: Billings, Montana Council for Indian Education.

- Western Interpretive Services, Inc., 1977, Historical resources and evaluations for the Powder River study area: Sheridan, Wyoming, prepared for Anthro Research.
- White, J. M., and Farrow, R.A., 1980, Subsidence of reclaimed coal mine spoils, Colstrip, Montana: Bulletin of the Association of Engineering Geologists, in press.
- White, K. L., Hill, A. C., and Bennett, J. H., 1974, Synergistic inhibition of apparent photosynthesis rate of alfalfa by combinations of sulfur dioxide and nitrogen dioxide: Environmental Science and Technology, v. 8, p. 574-576.
- Whittaker, R. H., Bormann, F. H., Likens, G. E., and Siccama, T. G., 1974, The Hubbard Brook ecosystem study; forest biomass and production: Ecological Monograph, v. 44, p. 233-252.
- Williams, Michael, 1978, Testimony on Colstrip units 3 and 4: Billings, Montana, U.S. EPA public hearing, February 12, 1978.
- Woessner, W. W., 1979, Input-output modelling of potential impacts of coal strip mining: Northern Cheyenne Reservation, Montana, Geological Society of America, Abstracts with Program, v. 11, no. 6.
- Woessner, W. W., Andrews, C. B., and Osborne, T. J., 1979, The impacts of coal strip mining on the hydrogeologic system of the northern Great Plains--A case study of potential impacts on the Northern Cheyenne Reservation: Journal of Hydrology, v. 43 (in press).
- Wong, C. S., 1978, Atmospheric input of carbon dioxide from burning wood: Science, v. 200, p. 197-200.
- Woods, M. J., 1978, Geochemistry of the Fort Union Formation with implications for quality of waters in mined lands: Report submitted to the NPRB-EIS State team, 56 p.
- Wyoming State Highway Department, Planning Division, 1977, Wyoming Traffic.
- Yannone, Vince, 1973, The black-footed ferret in Montana, in Linder, R. L., and Hillman, C. N., eds., Proceedings of the black-footed ferret and prairie dog workshop: South Dakota State University, Rapid City, September 4-6, 1973.
- Zeimens, G. M., and Walker, D. N., eds., 1977, Archeology of the eastern Powder River Basin, Wyoming: Report prepared for the U.S. Bureau of Land Management, under contract No. YA-512-RFP6-104.



INDEX MAP OF MONTANA

